

CALIFORNIA COASTAL COMMISSION

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W15a

MEMO

DATE: September 20, 2012

TO: Coastal Commissioners and Interested Parties

FROM: Charles Lester, Executive Director
Alison Dettmer, Deputy Director
Mark Delaplaine, Manager, Energy, Ocean Resources and Federal Consistency Division

RE: Condition Compliance, Consistency Certification CC-056-09, City of San Diego, Secondary Treatment Waiver

On October 7, 2009, the Commission conditionally concurred with the City of San Diego's Consistency Certification for the reissuance by the Environmental Protection Agency of a secondary treatment waiver for the E.W. Blom Point Loma Wastewater Treatment Plant (WTP) and ocean outfall (CC-056-09). During the hearing, the City agreed to the Commission's condition, which provided:

Wastewater Reclamation and Recycling Opportunities Study. The City will return for a public hearing before the Coastal Commission in (approximately) two years when its study of Wastewater Reclamation and Recycling Opportunities¹ is completed and the findings and recommendations have been documented in a report, and inform the Commission how, and to what extent, the City intends to implement the recommendations in the report or any alternatives to the recommendations in the report. If the City does not intend to implement the recommendations of the report, the City will provide an explanation of its reasoning to the Commission. As determined by the Commission, the City submitting the report and participating in any Commission hearings on the report shall constitute full compliance with this condition.

¹ This study refers to the City's Cooperative Agreement with San Diego Coastkeeper and the San Diego Chapter of Surfrider Foundation, approved on February 18, 2009 ... [Exhibit 15 from the Commission's Adopted Findings – copy attached].

On July 17, 2012, the City Council passed a resolution formally authorizing a report entitled “Recycled Water Study Final Draft Report.” On July 31, 2012, which was within two years of EPA’s August 1, 2010, issuance of the modified National Pollutant Discharge Elimination System (NPDES) permit for the discharges, the City submitted the report to the Commission staff. At the upcoming October 2012 Commission meeting, the City will, as specified in the above condition, “inform the Commission how, and to what extent, the City intends to implement the recommendations in the report or any alternatives to the recommendations in the report.”

Attached are: (1) the City’s cover letter sent with the Recycled Water report; (2) the Executive Summary from the report; and (3) the City’s Cooperative Agreement with Coastkeeper and Surfrider Foundation.



THE CITY OF SAN DIEGO

July 27, 2012

Mr. Mark Delaplaine
Federal Consistency Manager
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219

RECEIVED
JUL 31 2012
CALIFORNIA
COASTAL COMMISSION

Mr. Mark Delaphine:

Subject: Recycled Water Study

The City of San Diego is pleased to submit the Recycled Water Study (Study), dated July 17, 2012, as required in the Commission's Consistency Certification pertaining to the reissuance of the City's Secondary Treatment Waiver in 2010. The Study also satisfies the terms of the City's Cooperative Agreement with San Diego Coastkeeper and Surfrider Foundation, referenced in that Certification. Conceptual alternatives for increasing recycling by 135 million gallons per day (mgd) are described in the Study and were developed through a collaborative stakeholder participation process. Stakeholders included representatives from San Diego Coastkeeper and Surfrider Foundation, as well as the Metropolitan Wastewater Joint Powers Authority, the City's Independent Rates Oversight Committee, and the San Diego County Water Authority. The Study was presented to City Council on July 17, 2012, and the Council voted unanimously to receive the Study and consider the next steps towards implementation.

The alternatives in the Study were developed at a high planning level. As such, Section 8 of the Study contains a list of follow-on tasks that are needed to establish the technical and regulatory feasibility of implementing 135 mgd of increased recycling. The City's Water Purification Demonstration Project (Demonstration Project) is already underway, and the Final Project Report will be completed this calendar year. This report will include a discussion of the regulatory feasibility of indirect potable reuse utilizing the City's San Vicente Reservoir. The City is also planning to conduct facility siting studies and the development of a water-wastewater cost allocation framework. After these initial tasks are completed, subsequent tasks include preparing a financing plan, integrating implementation with the next Point Loma permit application, and conducting reservoir modeling to confirm the amount of indirect potable reuse possible at the City's Otay Reservoir.

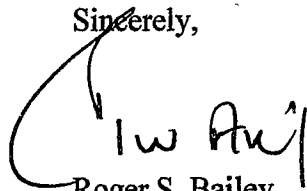


DIRECTOR OF PUBLIC UTILITIES
9192 Topaz Way • San Diego, CA 92123
(858)292-6401

Page 2
Mr. Mark Delaphine
July 27, 2012

If you have any questions, please contact me at 858-292-6401 or by email at RBailey@sandiego.gov.

Sincerely,

A handwritten signature in black ink that reads "Rw Bailey". The signature is written in a cursive style with a large initial "R" and "B".

Roger S. Bailey
Public Utilities Director

AB/cc

Enclosure: Recycled Water Study

cc: Mayor Jerry Sanders, City of San Diego
Members of the San Diego City Council
Honorable Jan Goldsmith, San Diego City Attorney
Jay Goldstone, Chief Operating Officer, City of San Diego
Andrea Tevlin, Independent Budget Analyst
Megan Baehrens, Executive Director, San Diego Coastkeeper
Bruce Bell, President, Carpenter Environmental Associates, Inc.
Julia Chunn-Heer, Representative, Surfrider Foundation
Marco Gonzalez, Chairperson, Coast Law Group, LLP
Dawn Guendert, Representative, Surfrider Foundation
Scott Huth, Past Chairperson, Metro-TAC
Karyn Keese, Representative, Metro-TAC/Atkins
Jim Peugh, Past Chairperson, IROC
Bruce Reznik, Executive Director, Planning & Conservation League
Toby Roy, Representative, San Diego County Water Authority
Jill Witkowski, Representative, San Diego Coastkeeper

SAN DIEGO RECYCLED WATER STUDY

EXECUTIVE SUMMARY

Background

In August 2009, the City of San Diego (City), along with key stakeholders, initiated the Recycled Water Study (Study) as part of a Cooperative Agreement (included in Appendix A) between the City and two environmental groups. This Study is intended to serve as a guidance document in helping policy leaders make the important decisions ahead regarding water reuse and the region's water and wastewater infrastructure.

Why Is Water Reuse Important to San Diego?

Water is important to the health, safety, and quality of life of people living in the San Diego region.

Historically, the region's 3.1 million residents have received a majority of their water supply from imported sources, including the California Bay-Delta (Bay-Delta) and the Colorado Rivers (conveyed via the California Aqueduct and the Colorado River Aqueduct, respectively). Currently, 80 percent of the San Diego region's water supply is imported. Local supplies and conservation account for the remaining 20 percent of the total supply. The region's reliance on imported water causes San Diego's water supply to be vulnerable to impacts from shortages and susceptible to price increases. In 2008, water supplied from the Bay-Delta was restricted to protect endangered fish species. In addition, drought conditions in Southern California further impacted water supply availability. With the region's population projected to reach 3.9 million people by 2030, demands will increase and strain these limited water supplies. Water reuse has been proven as a safe, reliable, locally controlled and sustainable option for the region.



Water Reuse in San Diego. Water reuse is an important component in San Diego's water supply portfolio.

What Other Drivers Affected this Study?

In 2010, the United States (U.S.) Environmental Protection Agency (EPA) allowed the City to continue to operate the Point Loma Wastewater Treatment Plant (Point Loma Plant) as a chemically enhanced primary treatment facility under a modification to its National Pollutant Discharge Elimination System (NPDES) Permit. The 2010 permit allows the City to operate in this fashion for five years until 2015, when the permit must be renewed. During the 2008-2010 permit modification process, two environmental organizations entered into a Cooperative Agreement with the City to conduct this Recycled Water Study. In accordance with the Cooperative Agreement, both of these organizations provided their support to the U.S. EPA's decision to grant the modification. The City's responsibility per the Cooperative Agreement is to execute this Study, which is also consistent with the City's long-term goals and objectives.

Water reuse programs provide valuable water supplies by using resources that otherwise are sent to the ocean. The decisions to invest in a water reuse program, or alternative large-scale wastewater system upgrades, will affect the rates, reliability, and regional assets for decades. The fundamental focus of this study was to develop water reuse alternatives and then weigh the alternatives against other options – with particular focus on the water supply benefits and the cost savings through reduced wastewater systems operations and improvements.



Recycled Water Study Chapter Summary

Chapter 1

Study Overview. Provides background and objectives of the San Diego Recycled Water Study, as well as describes the Study process and defines participating Stakeholders and Team Members, Study components, and important terminology used throughout the Study.

Chapter 2

Water Reuse Need and Related Activities. Presents the dynamic water supply conditions in San Diego and the opportunity to implement water reuse as a local supply through related key studies and activities such as the 2005 Water Reuse Study and 2010 Recycled Water Master Plan Update.

Chapter 3

Study Process and Evaluation Approach. Describes, in detail, the elements of the participatory Study process and defines the guidelines and criteria against which the potential recycled water opportunities were assessed.

Chapter 4

Key Facilities, Water Demands and Wastewater Flows. Summarizes the principal elements of San Diego's current water, wastewater, and recycled water infrastructure systems that impact water reuse planning, and provides the related demands and flows from these systems.

Chapter 5

Non-potable Recycled Water Opportunities. Describes the technical basis and foundation for developing the non-potable recycled water opportunities that were considered, such as existing and future demands, seasonal considerations, and locations and capacities of existing water recycling facilities.

Chapter 6

Indirect Potable Reuse Opportunities. Describes the technical basis and foundation for developing the indirect potable reuse opportunities that were considered in the Study, including reservoir augmentation and groundwater recharge, and other potential benefits of indirect potable reuse.

Chapter 7

Area Concepts. Provides detailed, comparable options, including both non-potable recycled water opportunities and indirect potable reuse opportunities, to develop comprehensive water reuse plans within three key Study areas.

Chapter 8

Integrated Reuse Alternatives. Evaluates the water reuse concepts presented in Chapter 7 based on Study goals, as well as provides a comparable financial evaluation for key alternatives, including a description of the financial model and its components.

Chapter 9

Study Outreach and Approvals. Describes the Study presentations given to stakeholder groups and approving bodies.

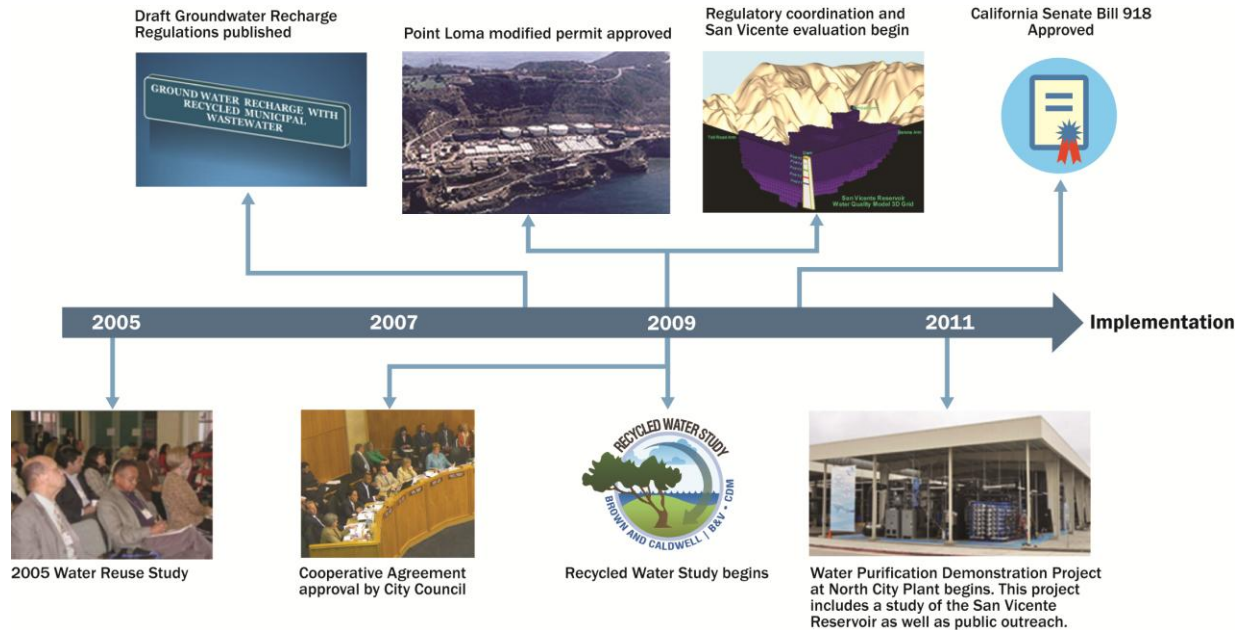
Supporting Material Summary

GLOSSARY	Defines important terminology and acronyms used throughout the Study.
APPENDIX A	Cooperative Agreement. Provides a copy of the signed agreement between the City of San Diego, the San Diego Coastkeeper, and the San Diego Chapter of the Surfrider Foundation to conduct a Recycled Water Study.
APPENDIX B	Point Loma Plant Conclusions. Provides data and conclusions on the Point Loma Plant based on the results of the Study, including an allocation of flows, discussion on chemically enhanced primary treatment, and projected 2050 mass emission rates under various scenarios.
APPENDIX C	Summary of Regulations That Affect Water, Wastewater and Recycled Water. Provides an overview of the key regulatory considerations for water, recycled water and wastewater, and includes anticipated regulatory criteria related to indirect potable reuse sizing.
APPENDIX D	California Senate Bill 918. Provides background on State of California Department of Public Health requirements for developing uniform criteria for groundwater recharge, reservoir augmentation and direct potable reuse.
APPENDIX E	Siting Analysis Documents. Provides siting information on the Harbor Drive, Camino del Rio and Morena sites, City ownership, and an alternatives analysis performed by the City.
APPENDIX F	Conceptual Cost Estimates for the Integrated Reuse Alternatives. Provides infrastructure sizing and costs for each Integrated Reuse Alternative component.
APPENDIX G	National Water Resource Institute (NWRI) White Paper On Direct Potable Reuse
APPENDIX H	Recycled Water Study Cost Methodology FAQ. An informative, frequently asked question (FAQ) style document on how the direct and indirect wastewater cost reductions/credits/savings were calculated.
APPENDIX I	Participating Agency White Paper on Reuse Concepts
APPENDIX J	Comment/Response Form. Provides responses to Stakeholder comments made during the Study.
APPENDIX K	Conceptual Metro System Flow Schematics. Graphics showing the reuse alternatives and accounting of flows throughout the system.
APPENDIX L	Metro JPA Letter
APPENDIX M	City Council Resolution



How Does This Study Fit into Other On-going Efforts?

The overarching objective of this Study is to develop and clearly present integrated reuse alternatives that the public and policy-makers can review and select from to guide the future of the reuse program located within the Metropolitan Sewerage System Service Area. The alternatives were evaluated to meet City, Participating Agency, and Project Stakeholder reuse goals through a 2035 planning horizon. This Study is one part of a comprehensive regional program to evaluate and develop water reuse in San Diego.



Who Participated in the Study?

The Stakeholders for this Project are comprised of the San Diego Coastkeeper, the San Diego Chapter of the Surfrider Foundation, and the Participating Agencies of the Metropolitan Wastewater Joint Power Authority (Metro JPA), who have capacity rights in the Metropolitan Sewerage System pursuant to the provisions of the 1998 *Regional Wastewater Disposal Agreement Between the City of San Diego and the Participating Agencies in the Metropolitan Sewerage System*. The San Diego County Water Authority (SDCWA), the agency that has primary responsibility for water supply planning efforts, and the Independent Rates Oversight Committee, are also Stakeholders in the Study. The primary Project Team consisted of City staff from the Public Utilities Department and a consulting team from Brown and Caldwell, Black & Veatch, and CDM.

PROJECT STAKEHOLDERS

Environmental Groups

- San Diego Coastkeeper
- Surfrider Foundation, San Diego Chapter

Oversight Groups

- Independent Rates Oversight Committee (IROC)

Regional Water Supplies

- San Diego County Water Authority (SDCWA)

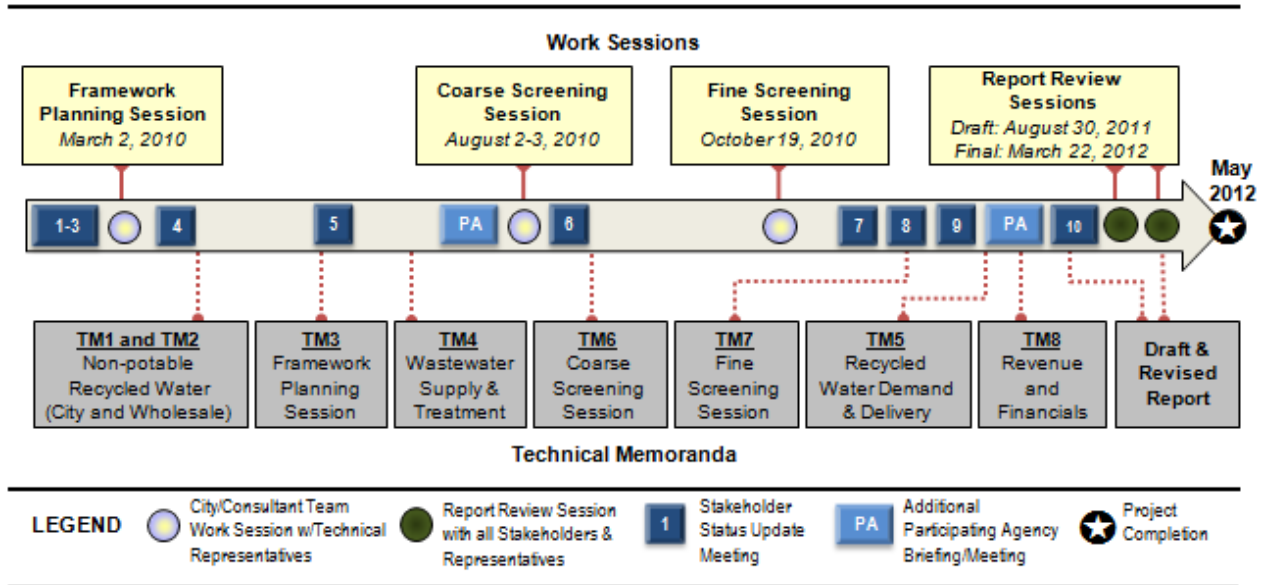
Participating Agency Members

- City of Chula Vista
- City of Coronado
- City of Del Mar
- City of El Cajon
- City of Imperial Beach
- City of La Mesa
- City of National City
- City of Poway
- Lemon Grove Sanitation District
- Otay Water District
- Padre Dam Municipal Water District
- San Diego County Sanitation District
 - Alpine Sanitation District
 - Lakeside Sanitation District
 - Spring Valley Sanitation District
 - Winter Gardens Sewer Maintenance District



What Was the Study Process?

The Study includes a number of technical evaluations and coordination steps to identify and evaluate reuse alternatives within the City as well as areas served by the Participating Agencies. Throughout the Study, regular Stakeholder Status Update Meetings were held to present progress and to receive input and feedback on the activities. Eight technical memoranda were developed to document information.



How Were Alternatives Developed?

Alternatives were developed through a participatory process. Stakeholder Status Update Meetings and five work sessions were used to frame, develop, refine, and communicate the Alternatives included in this Study.



Work Sessions. The Coarse Screening and Fine Screening Sessions included presentations, team exercises, and facilitated discussions. The sessions leveraged the group’s creativity and diverse perspectives to improve the quality of the Alternatives presented in the Study.

What Issues and Opportunities Helped Determine the Water Reuse Target?

The water reuse target, similar to past efforts, was based on Study goals, Stakeholders' input, and findings from technical analyses. The goal of the 2005 Water Reuse Study was to maximize the available capacities at the North City and South Bay Plants, which coincided with a target of approximately 20 mgd for future water reuse projects. This 2012 Study was initiated with a broader basis: to consider the water reuse goal to be limited *only* by the amount of wastewater available in the Metro Service Area. This is a more comprehensive goal, providing the potential to reuse ten times more water than previous targets, with approximately 200 mgd projected to be available in the Metro Service Area on an average dry weather year in 2035. During the Study, the following four measures evolved as primary drivers for establishing the water reuse target:

Measure 1: Value of Water. Multiple forces are driving water reuse in Southern California. Water reuse projects produce high-quality, reliable, uninterrupted local water to the region, serving the same purpose as imported untreated water. Imported untreated water rates will continue to rise, and conveyance system improvements will be needed to deliver imported water to the region's water treatment plants - unless the supply is supplemented with new local supplies. Indirect potable reuse can fulfill this need and, over time, do so at lower costs – especially when reduced capital and operating costs at the Point Loma Plant are considered. Savings would likely increase further if the regulatory framework for Direct Potable Reuse is finalized, allowing direct delivery to the region's potable water treatment plants. Based on these considerations, the reuse target for this study, especially the indirect potable reuse portion, should be maximized.

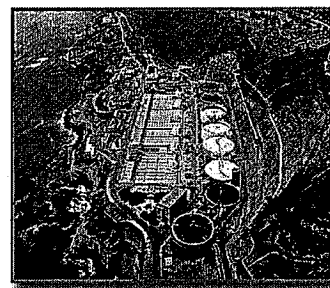
Measure 2: Water Quality Benefits. Two water quality considerations were taken into account in establishing a water reuse target: ocean water quality and imported water salinity. Both are important, and both would be significantly improved through implementation of the water reuse projects identified in this Study. For example, blending advanced purified water with imported water in San Vicente Reservoir and Otay Lakes could reduce salinity levels by 50 percent. On land, the reservoirs that receive the advanced purified water, the residents that use the water, and the soil that is irrigated with the water would all benefit from having water with up to half the current salinity levels. Residents would benefit from softer water and extended lives of household appliances such as water heaters, dishwashers, clothes washers and faucets. Ocean water quality would also improve by removing and diverting solids to the Metropolitan Biosolids Center. Based on these considerations, the water reuse target for this Study should be maximized.

Measure 3: Beneficial Project Size versus Costs. Project sizing was considered a limiting factor in developing the water reuse target. Non-potable recycled water projects, while beneficial for targeted areas (such as Otay Water District's planned system expansion), did not have enough demand potential to use a substantial portion of the available wastewater. It also became apparent that developing indirect potable reuse projects to use all wastewater available in the Metro System would not be practical or provide the right balance of costs and benefits. Therefore, the water reuse target based on project constraints and permit considerations was approximately 80 to 120 mgd (upper end based on estimated regulatory flow limits to the San Vicente Reservoir in conjunction with the South Bay Spring Valley No. 8 Diversion).

Four Measures that Established the Water Reuse Target:

- **Measure 1: Value of Water.** Reliable water supplies are needed for San Diego.
- **Measure 2: Water Quality.** Reuse can improve the ocean water quality. Indirect potable reuse can significantly reduce salinity levels benefiting ratepayers.
- **Measure 3: Project Size vs. Costs.** Water reuse targets should be based on project sizing that considers costs and regulatory limits.
- **Measure 4: Reuse Program Induced Savings.** The water reuse program sizing should consider reduced capital and operating costs in the drinking water and wastewater systems.

Measure 4: Reuse Program-Induced Savings, Offsets. San Diego has the potential to create a valuable new water supply cost effectively due to the reuse program's benefit of reducing capital and operating costs in the downstream wastewater system and water quality improvements benefitting the water systems. The largest cost savings generated by the reuse program is reduced capital and operational costs at the Point Loma Plant. Leading up to the Fine Screening Sessions, a reuse target of approximately 100 mgd was established to achieve cost savings by avoiding certain upgrades at the Point Loma Plant. At 100 mgd, and based on dry weather flows, certain treatment processes were avoided. This target was later re-evaluated against a scenario in the City's September 2011 Draft Wastewater Master Plan that included a 10-year wet weather return flow event in establishing 2050 annual average daily flows. While the specific upgrades at the Point Loma Plant and the diversions to South Bay changed when coordinated with the September 2011 Draft Wastewater Master Plan, the Integrated Reuse Alternative costs remained relatively unaffected, and therefore no changes to the Alternatives were made.



Savings at the Point Loma Plant. Savings at the Point Loma Plant played an important role in establishing reuse targets. The land available at Point Loma Site is constrained, and any upgrades incur high costs.

Cost Methodology

A detailed financial evaluation was performed for each Integrated Reuse Alternative considered in this Study. The financial evaluation was prepared to ultimately help decision-makers compare the costs of different water reuse approaches and to aid in making decisions about whether to invest in the water reuse system. The guiding principles for the evaluation included:

Transparency. Provide transparent costing of alternatives.

Input and Access. Provide multiple opportunities at workshops and Stakeholder meetings to review, discuss, and debate project costs.

Comparative and Comprehensive Alternatives Costs. Prepare a comparative financial evaluation of the Integrated Reuse Alternatives and include financing costs.

Cost Context. Compare the water reuse alternative costs to other options facing the City and Participating Agencies.

How were costs calculated, and was cost sharing discussed?

The financial evaluation process included the following steps:

Unit Costs. Unit costs were developed from over 50 sources of information, including 23 bid summaries, two agency estimating tools, 14 project cost estimates, actual operating costs, and insight and experience from three national consulting firms.

Alternative Costs. Capital costs and operational and maintenance (O&M) costs were compiled in an interactive model. Costs were thoroughly developed and reviewed in five interactive workshops and a series of Status Update Meetings with the Project Stakeholders.

Financial Model Costs. Capital and O&M costs for each alternative were entered into a net present value (NPV) financial model that included financing costs and other variables. The financial model assumptions were closely coordinated with the City's financial staff to match typical City financing assumptions. The model was also vetted with the project stakeholder group (including the Participating Agencies' independent financial model expert).

Cost Framework. A cost framework for sharing project costs between the City and Participating Agencies was outlined in the Study. Multiple options were outlined based on an interactive workshop with project stakeholders.



How are costs presented in the Study?

Costs are presented in dollars per acre foot (\$/AF). The costs are broken down into Gross Costs and Net Costs as defined below. Net Costs are broken out further into three tiers or thresholds to provide a breakout for different conditions and to display values at each calculation step. The following summarizes the cost methodology. The resulting Alternative Costs are presented later in this Executive Summary.

What are Gross Costs?

Gross Costs include the capital and O&M costs for completing and operating the recycled water projects. The Gross Cost financial evaluation included a sensitivity analysis using the following three variables: project contingencies (ranging from 20 to 40 percent), Grants (ranging from 10 to 30 percent), and Metropolitan Water District/San Diego County Water Authority Local Resource Program (LRP) credits (ranging from \$100/AF to \$450/AF). The Favorable Scenario assumed the best case (20 percent contingency, 30 percent grants, \$450/AF LRP). The Unfavorable Scenario assumed the worst case (40 percent contingency, 10 percent grants, \$100/AF LRP). This sensitivity analysis was performed since stakeholder opinions varied on what the proper assumption should be. For the Study, the Stakeholder group agreed to use an average of these values.

Gross Cost Variables				
Item	Description	Favorable Scenario	Unfavorable Scenario	Average
Grants	To help offset the costs associated with projects, the City can apply for grants to help finance a portion of the capital projects.	30%	10%	20%
Local Resource Program	To help offset the costs associated with new water projects, the City has participated in the Local Resource Program offered by MWD and the Local Water Supply Development funding provided by the SDCWA (these two programs are collectively referred to herein as the LRP).	\$450/acre-foot, 20 years	\$100/acre-foot, 20 years	\$275/acre-foot, 20 years
Project Contingency	A project contingency was added to the construction costs of all alternatives to account for unanticipated project costs.	20%	40%	30%

What are Net Costs?





Net Costs are considered “real” or “true” costs for the purposes of comparing reuse projects to imported untreated water and other alternative water sources. Net Costs account for savings, offsets and credits that occur as a result of the reuse projects. For example, constructing a new reuse plant upstream of the Point Loma Plant reduces flows to the Point Loma Plant, resulting in lower capital and operational costs at the Point Loma Plant. These reduced costs are subtracted from the Gross Costs to get the Net Costs or “true” program cost. This is similar to the Orange County Groundwater Replenishment System, which was responsible for substantial savings by avoiding costly outfall improvements. The variables considered with the Net Cost calculations are described in the table on the next page. The Study also includes a Cost Methodology Summary in Appendix H. The Cost Methodology Summary is presented in an informative, frequently asked question (FAQ) format. This document summarizes direct and indirect wastewater savings calculations and includes a graphical comparison of the key wastewater facilities included in this Study with the facilities included in the City’s September 2011 Draft Wastewater Master Plan.

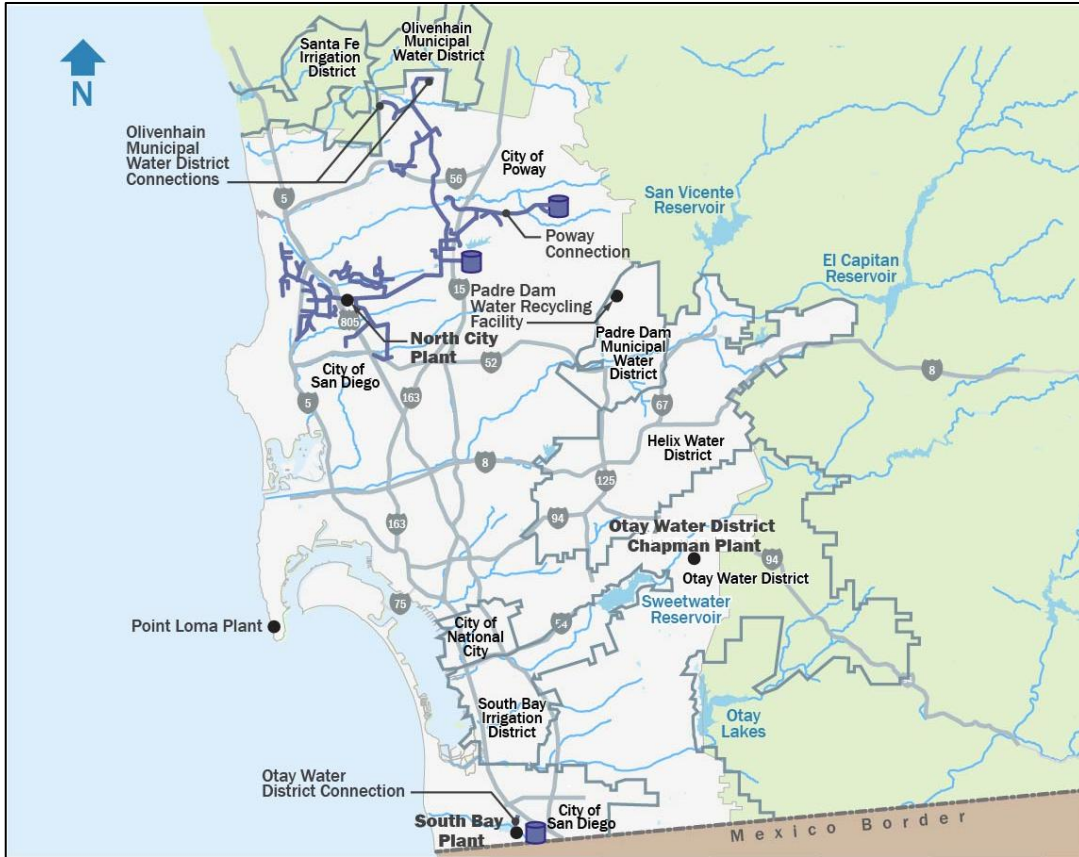
Net Cost Variables		
Component	Description	Savings
Tier 1 - Direct Wastewater System Savings <ul style="list-style-type: none"> Reduction of flows to downstream facilities Remaining Point Loma capacity is upgraded to Secondary 	<p>The Study's Alternatives achieve the goal of offloading flows away from the Point Loma Plant, resulting in reduced capital and operating costs at downstream wastewater facilities. The direct wastewater system savings were calculated by comparing the size of the Point Loma Plant proposed in the City's September 2011 Draft Wastewater Master Plan (adjusted to a secondary treatment option to the smaller Point Loma Plant size (which includes secondary treatment) in this Study (assuming the reuse projects in this Recycled Water Study are implemented). The cost difference is the savings directly attributable to these reuse projects. Key savings include:</p> <ul style="list-style-type: none"> Smaller Point Loma Plant facilities (less flow is treated at the Point Loma Plant) Smaller wet weather equalization basin (less flow reaches the Point Loma Plant) Less pumping at Pump Station No. 2 (less flow is diverted to the Point Loma Plant) Less pumping at Pump Station No. 1 (more reuse occurs at the South Bay Plant since more flow is diverted away from Pump Station No. 1) 	<p>\$557 million (capital savings)</p> <p>\$27.6 million/year (operation and maintenance savings)</p>
Tier 2 - Salt Reduction Credit <ul style="list-style-type: none"> Water quality improvements to water & wastewater systems due to indirect potable reuse Homeowner and business benefits not included in total 	<p>Similar to the 2005 Water Reuse Study, a salt credit was considered to account for the benefits of salinity reduction in the watershed. The salt credit basis is from the 1999 Salinity Management Study (MWD, USBR). The quantitative credit shown is the financial benefits of extending the life of the municipal water and wastewater treatment systems from having lower salinity levels in the water and wastewater flows. The San Vicente and Otay Lakes Reservoirs could see dramatic reductions in salinity levels from the proposed indirect potable reuse projects. Downstream agency facilities, including drinking water treatment plants and the Harbor Drive advanced water purification facilities, would benefit from this reduced salinity. In addition to the benefit shown, there is a benefit to water customers, since water heaters, clothes washers, dishwashers, and fixtures will also last longer with lower salinity levels. The combined savings included in the City's 2005 Water Reuse Study was \$250/AF. The \$100/AF value used in this Study only accounts for the estimated municipal treatment equipment savings.</p>	<p>\$100/acre foot (not including customer savings)</p>
Tier 3 - Indirect Wastewater System Savings <ul style="list-style-type: none"> Remaining Point Loma capacity maintained at CEPT Quantifies savings if this approach is attributable to the reuse program 	<p>The Point Loma Plant will either continue to use chemically enhanced primary treatment (CEPT) or will require upgrades to secondary treatment. This Study does not provide an opinion on whether CEPT or secondary treatment processes should be employed at the Point Loma Plant. However, it is prudent to summarize the reduced Point Loma Plant-related capital and operational costs if CEPT status could be maintained for the remaining Point Loma Plant capacity after reuse projects and with the South Bay Diversion. The indirect wastewater savings are therefore calculated as the avoided secondary treatment costs at the Point Loma Plant.</p>	<p>\$463 million (capital savings)</p> <p>\$13.0 million/year (operation and maintenance savings).</p>
Qualitative Water System Savings	<p>The local, regional and statewide water systems were considered for potential savings from increasing water reuse. Since quantitative costs could not be developed with current available information, qualitative benefits were considered, particularly at the regional and statewide level. The region's local water treatment plants treat water from local runoff (which is limited) and imported untreated water from the SDCWA and MWD (which is subject to cutbacks and higher price fluctuations). Indirect potable reuse projects provide a reliable, uninterrupted untreated water equivalent that would help supply the local water treatment plants that ratepayers have invested in over the past decade. Indirect potable reuse projects may defer or eliminate the need to expand the imported untreated water conveyance system needed to serve these treatment plants. The SDCWA Master Plan (currently underway) may help quantify what these benefits are in future updates to this Study. In addition, Stakeholders emphasized an additional benefit related to the need to fix water supply conditions in the California Bay-Delta (which has the potential for substantial cost impacts for Southern California). Water reuse projects reduce the burden on importing water from the Bay-Delta, providing an additional benefit for these projects.</p>	<p>Quantitative benefits are speculative, therefore this category is currently considered qualitatively</p>



What is the Existing Recycled Water System?

The City operates two water reclamation plants as part of the Metro System: the North City Plant and the South Bay Plant. Two additional reclamation plants (each separately owned and operated by a Participating Agency and separate from the Metro System) also offload flows before reaching the Metro System. The City also operates a non-potable recycled water system comprised of two service areas—the Northern Service Area and the Southern Service Area—supplied with recycled water from the North City and South Bay Plants, respectively. Three wholesale purchasers of recycled water for the City are located within the service area: City of Poway and Olivenhain Municipal Water District (Northern Service Area) and Otay Water District (Southern Service Area).

Recycled Water System in the San Diego Service Area			
Treatment Plant	Year Commissioned	Design Capacity	Description
<p>North City Water Reclamation Plant</p> 	1997	30 mgd	Part of City of San Diego’s Metro System. Treats wastewater generated in the Northern San Diego Region, including Cities of Del Mar and Poway, and the communities of Mira Mesa, Rancho Penasquitos, Scripps Ranch, and Rancho Bernardo. Tertiary-treated water is distributed to surrounding communities for irrigation and industrial uses. Excess wastewater ultimately flows to the Point Loma Plant.
<p>South Bay Water Reclamation Plant</p> 	2002	15 mgd	Part of City of San Diego’s Metro System. Located in the Tijuana River Valley near the international border. Tertiary-treated wastewater is distributed to surrounding areas for non-potable recycled water use.
<p>Padre Dam Water Recycling Facility</p> 	1967	2.0 mgd	Owned and operated by Padre Dam Municipal Water District and treats wastewater from the City of Santee, portions of the City of El Cajon, and the unincorporated community of Lakeside. Treated wastewater that is not recycled for irrigation and industrial use is discharged to the Santee Lakes and ultimately reaches the San Diego River. Padre Dam, in conjunction with Helix Water District, is evaluating the ability to expand the plant as part of indirect potable reuse project in the El Monte Valley.
<p>Ralph W. Chapman Water Recycling Facility</p> 	1988	1.1 mgd	Owned and operated by Otay Water District. Recycled water is used for irrigation in Eastlake, Otay Ranch, Rancho Del Rey, and other areas of Chula Vista.



Existing Recycled Water Facilities

What Projects Will Affect Future Reuse in San Diego?

The City’s 2005 Water Reuse Study recommended an indirect potable reuse project at the North City Plant that would deliver water to the San Vicente Reservoir. To begin implementing this project, the City completed construction of the Advanced Water Treatment Facility, a component of the Water Purification Demonstration Project, in 2011 at the North City Plant. This project, and the corresponding modeling study of the San Vicente Reservoir, will provide data on the health, safety, and water quality of advanced treated recycled water. A separate project, the San Vicente Dam Raise, is currently underway and will increase the potential for integrated indirect potable reuse projects at this regional facility.



Water Purification Demonstration Project. The City’s Water Purification Demonstration Project will demonstrate how one million gallons per day can be purified using technology that is able to produce one of the most pristine sources of water available anywhere.



San Vicente Dam Raise. The San Vicente Reservoir expansion (architectural rendering shown above) and its integration with regional facilities make this reservoir an ideal candidate for indirect potable reuse.

What Opportunities Were Considered for the Reuse Solutions?

Non-Potable Recycled Water Opportunities



Since the City has a non-potable system in place, focus was placed on expanding this system by locating new demands. The demands would then be met by expanding the distribution system from an existing plant or by constructing a new treatment facility closer to the demand. Both Citywide (increasing use within the City’s service area) and wholesale (increasing supply to agencies adjacent to or already connected to the existing system) were considered through a market assessment. The market assessment showed where potential conversion customers were concentrated (for example, the Rancho Bernardo area). Based on the markets, distribution systems were developed to determine costs. An analysis of the results, including a direct comparison of an alternative both with and without service to the Rancho Bernardo area, showed that the construction costs to dual pipe an existing community and the administrative costs required to permit, coordinate, bill and provide backflow testing were higher than the indirect potable reuse approaches for new areas. Therefore, the non-potable recycled water opportunities carried forward were focused on maximizing the existing system where most economical. The non-potable recycled water demands carried forward can be summarized as the existing demands, planned demands, and future demands (which includes 3 mgd for expanded service from the South Bay Plant occurring between 2026 and 2040).

Indirect Potable Reuse Opportunities

Achieving a water reuse target with the potential to use all the Metro System service area resources reinforced the need to look for larger projects with improved economy of scale. Indirect potable reuse projects provided the needed scope and scale for this purpose. Two types of indirect potable reuse were considered: reservoir augmentation and groundwater recharge. Eleven regional reservoirs were initially considered. Three were advanced for more detailed evaluation: San Vicente Reservoir (with the current dam raise project), Otay Lakes, and Lake Hodges. Eight regional groundwater basins were reviewed, and two were carried forward for more detailed evaluation: El Monte Valley Basin and San Pasqual Basin. Advancing reservoirs/basins was based on the location, costs, potential project sizes, and ability to integrate into the water system.

Benefits of Indirect Potable Reuse

- Maximizes use of existing reclamation capacity
- Reduced capital and operating costs in downstream wastewater systems, particularly the Point Loma Plant
- Less seasonally limited than non-potable recycled water with fixed irrigation demands
- Superior ability to improve water quality by significantly reducing total dissolved solids/salinity

Successful Southern California Indirect Potable Reuse Projects



Orange County Water District’s Groundwater Replenishment System. The Groundwater Replenishment System is the world’s largest wastewater purification system for indirect potable reuse and it is located just north of San Diego in Orange County, California. The Orange County Groundwater Replenishment System can produce up to 70 mgd of highly purified recycled water that serves the water demands of nearly 600,000 residents.



Montebello Forebay. Located in Los Angeles County, the Montebello Forebay has been recharged dating back to 1960s. The area is currently recharged with 150,000 acre-feet of local, imported, and recycled water annually. Of the 5.6 million acre feet recharged into the basin since the 1960s, 26 percent was from recycled water sources.



West Coast, Dominguez Gap, and Alamitos Barriers. Los Angeles and Orange Counties also use seawater intrusion barriers to protect and supplement groundwater supplies. Recycled water is injected into wells along these basins to prevent high salinity seawater from reaching the groundwater basin supplies. The injected recycled water also supplements the groundwater that is extracted by wells and serves the drinking water system.

How Were Opportunities Compiled into Area Concepts?

Area Concepts were developed to provide detailed, comparable options for discussion at the Coarse Screening Session and Stakeholder Status Update Meetings, and were then refined and compiled into Integrated Reuse Alternatives. The Area Concepts were strategically selected, based on the locations of available wastewater, existing facilities, and delivery points (non-potable recycled water customers, surface water reservoirs, or groundwater basins).

Opportunities were sized and then pieced together by laying out treatment and conveyance facilities. Cost information was also developed, with pumping costs being a particularly important component because of the variability of pumping costs for indirect potable reuse, non-potable water, and wastewater. The availability of this information allowed Stakeholders to compare the benefits of different approaches within each area. For example, Alternatives that required extensive wastewater pumping (which requires pumping approximately 30-percent more flow than advanced treated water), were identified as having added costs and risks compared to other Alternatives. This point led to development of the Harbor Drive Plant concept later in the Study.



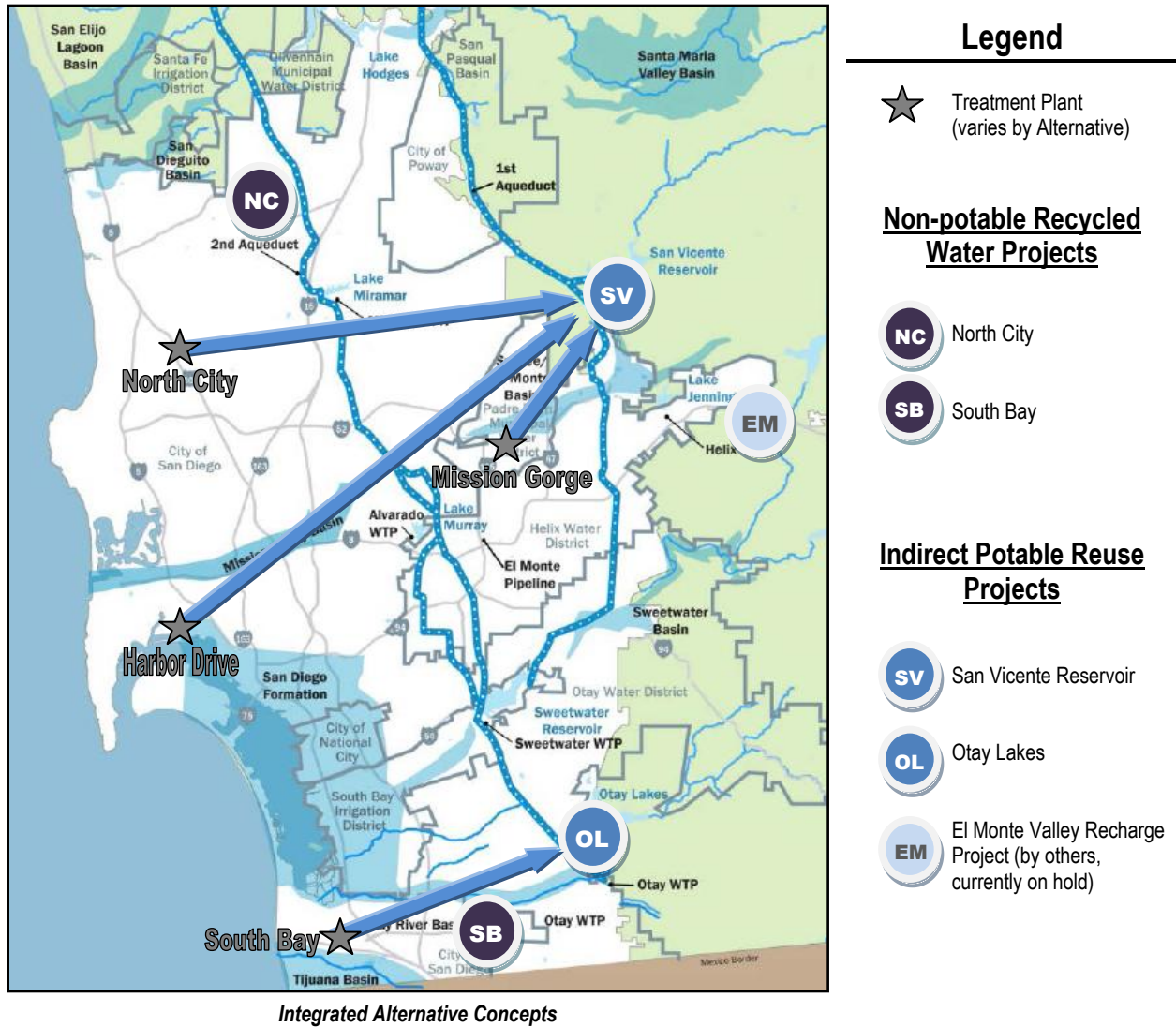
Area Concepts. Area Concepts were developed for three regions of the Metro Service Area. The Area Concepts were presented at the Coarse Screening Session.

Area Concept Summary		
Area	Base Concept Presented at the Coarse Screening Session	Additional Considerations after Stakeholder Review
San Vicente/ North City	<ul style="list-style-type: none"> Complete planned non-potable recycled water projects Maximize indirect reuse of water produced at North City Plant with diversions from <ul style="list-style-type: none"> Morena Mission Valley Treat and produce water at Mission Gorge Account for El Monte Valley indirect potable reuse project 	<ul style="list-style-type: none"> Reduce pumping of wastewater by eliminating diversion of wastewater at Mission Valley Treat and produce water at Harbor Drive site Consider both split plant and consolidated plant at Harbor Drive and Mission Valley to minimize site needs Consider additional costs and complexities related to expanded North City Plant beyond master-planned capacity of 45 mgd
South Bay	<ul style="list-style-type: none"> Complete planned non-potable recycled water projects Wastewater diversions from different locations along the South Metro Interceptor (depending on the option) Consider serving additional non-potable recycled water demands Indirect potable reuse of water produced at South Bay Plant 	<ul style="list-style-type: none"> Consider increased diversion totals by locating the diversion further North at the Spring Valley No. 8 connection
Rancho Bernardo/ San Pasqual	<ul style="list-style-type: none"> Rancho Bernardo/I-15 Corridor, non-potable recycled water San Pasqual indirect potable reuse (two variations) 	<ul style="list-style-type: none"> Determined that these options do not offload the Point Loma Plant and provide limited benefits to other opportunities Consider private entities funding a majority of the improvements needed





How Were Area Concepts Refined into Integrated Reuse Alternatives?

Area Concepts were refined into Integrated Reuse Alternatives in the Fine Screening Session. Fine Screening Session participants considered a series of projects to meet the 100 mgd water reuse target. The non-potable recycled water demands and the indirect potable reuse project delivery locations that advanced to the Fine Screening Session are summarized in the two adjacent tables and are shown on the figure below.









Non-potable Recycled Water. Expansion of the non-potable recycled water systems is planned primarily through 2015, with additional growth in South Bay through 2040 based on Otay Water District’s projections, as shown below.

Non-Potable Recycled Water Projected Demands											
Map Code	Agency	Existing 2009/2010		Planned 2010-2015		Planned (OWD) 2015-2026		Future (OWD) 2026-2040		Total	
		AFY	mgd	AFY	mgd	AFY	mgd	AFY	mgd	AFY	mgd
North City Plant											
	City of San Diego	6,394	5.7	1,959	1.7	0	0.0	0	0.0	8,353	7.4
	City of Poway	428	0.4	323	0.3	0	0.0	0	0.0	751	0.7
	Olivenhain MWD	642	0.6	458	0.4	0	0.0	0	0.0	1,100	1.0
	Total North City	7,464	6.7	2,740	2.4	0	0.0	0	0.0	10,204	9.1
South Bay Plant											
	City of San Diego	1,539	1.4	-639	-0.6	0	0.0	0	0.0	900	0.8
	Otay Water District	3,209	2.9	1,395	1.2	1243	1.1	3,363	3.0	9,210	8.3
	Total South Bay	4,748	4.2	756	0.7	1,243	1.1	3,363	3.0	10,110	9.0
North City and South Bay Plants											
	Total Combined	12,212	10.9	3,496	3.1	1,243	1.1	3,363	3.0	20,314	18.1

Notes: See Study Table 5-3 for notes. Demands shown are average annual demands. Reductions in demands for South Bay between 2010 and 2015 are associated with changes at the International Boundary and Water Commission Plant, which will no longer require non-potable recycled water for process uses.

Indirect Potable Reuse. Two surface water augmentation projects and a groundwater recharge project were advanced into the Fine Screening Session. In addition, the El Monte Valley Groundwater Augmentation Project (being planned by others) was assumed to occur and its impacts were taken into consideration.

Indirect Potable Reuse Projects Advanced					
Map Code	Reservoir or Basin	Storage Capacity (acre-feet)	Reuse Potential		Key Considerations
			AFY	mgd	
Surface Water Reservoir Candidates Advanced to the Fine Screening Session					
	San Vicente (w/ Dam Raise) 	249,358	Up to 100,000	Up to 89	Recommended approach from 2005 Water Reuse Study. The dam raise, scheduled for completion between 2013 and 2014, will increase retention times and indirect potable reuse capacity potential, and provides the ability to distribute water throughout the region and to the largest water treatment plants.
	Otay Lakes 	49,849	Up to 25,000	Up to 22	Previous recommendation from 2005 Water Reuse Study, with proximity to South Bay Plant. Located adjacent to the 33 mgd (2035 capacity) Otay Water Treatment Plant.
Groundwater Augmentation Project by Others Considered					
	El Monte Valley (or similar project) 	10,000 to 50,000	5,000	4.5 to 5.0	The El Monte basin was evaluated by the Helix Water District and the Padre Dam Municipal Water District for an indirect potable reuse groundwater augmentation project. This project was coordinated with this Study since wastewater flows for this project affect downstream wastewater availability in the Metro System. Although this project is currently on hold, it or a similar project could further offload the wastewater system and provide valuable new water to the region. The status of this project is anticipated to be tracked as an Implementation Step.

Notes: See Study Tables 6-1 and 6-3 for notes. Demands shown are average annual demands.



What was the Rationale for Numbering the Integrated Reuse Alternatives?

The following summarizes the numbering system used. Each Alternative includes common South Bay components

Alternatives:

“A” Alternatives. The “A” Alternatives expand the North City Plant to 45 mgd (the site’s master-planned capacity) using the Morena Diversion. The added capacity at North City allows the Harbor Drive Plant to be smaller than the “B” Alternatives.

“B” Alternatives. The “B” Alternatives maximize the existing North City Plant capacity at 30 mgd (which occurs once the initial 15 mgd indirect potable reuse project is complete). The smaller total at the North City Plant requires the Harbor Drive Plant to be larger than the “A” Alternatives.

Sub-Alternatives:

“1” Sub-Alternatives. Alternatives “A1” and “B1” differ from the “2” (A2, B2) and “3” (B3) alternatives by splitting the Harbor Drive water reclamation treatment processes and the advanced purification facility treatment into different sites (the advanced purification processes are located at the Camino Del Rio site described in Chapter 7). This adds a fourth plant site to these alternatives.

“2” Sub-Alternative. Alternatives “A2” and “B2” also relate to the Harbor Drive Plant. The “2” Alternatives place all the Harbor Drive water reclamation and advanced purification treatment processes at a combined plant along Harbor Drive (similar to how the proposed North City and South Bay Plants will be configured). The Harbor Drive Plant in these alternatives is larger, but the operation is efficiently consolidated to a single site.

“3” Sub-Alternative. Alternative “B3” is the same as Alternative “B2”, except that it includes a small plant in Mission Gorge to collect, treat, and convey water to the San Vicente Reservoir. This adds a fourth plant, but it is the closest location to the San Vicente Reservoir.

Major Alternatives

“A” Alternatives =
North City at 45 mgd + South Bay
with SV8 diversion

“B” Alternatives =
North City at 30 mgd + South Bay
with SV8 diversion

Sub-alternatives Based on Siting Elements

“1” Alternatives
split plant between Harbor Drive
& Camino del Rio

“2” Alternatives
combined Harbor
Drive Plant

“3” Alternative
combined Harbor Drive plant
and an additional plant at
Mission Gorge

Summary of Integrated Reuse Alternative Elements

Integrated Reuse Alternatives were formed based on the project goals established by the project Stakeholders, the criteria developed at the Framework Planning Session, and the screening work performed at the Coarse Screening and Fine Screening Sessions, and subsequent Stakeholder Status Update Meetings. The following table summarizes the elements included in each Integrated Reuse Alternative.

Integrated Reuse Alternative Summary - Elements Included					
Elements in the Area Concept	A1	A2	B1	B2	B3
Elements from the North City/San Vicente Area Concept Themes					
Existing non-potable recycled water demands (6.7 mgd)	✓	✓	✓	✓	✓
Planned non-potable recycled water demands (2.4 mgd)	✓	✓	✓	✓	✓
North City Plant w/indirect potable reuse to San Vicente (15.0 mgd)	✓	✓	✓	✓	✓
Morena Diversion w/North City Plant expansion & indirect potable reuse to San Vicente (11.9 mgd)	✓	✓			
Harbor Drive Plant w/indirect potable reuse to San Vicente (capacity varies depending on the Alternative: 40.9 mgd for A1/A2; 52.8 mgd for B1/B2; and 46.0 mgd for B3)	✓	✓	✓	✓	✓
Harbor Drive consolidated WRP/AWPF plant		✓		✓	✓
Harbor Drive WRP/Camino Del Rio AWPF split plant	✓		✓		
Mission Gorge Plant w/indirect potable reuse to San Vicente (6.8 mgd)					✓
Elements from South Bay Area Concept C2					
Existing non-potable recycled water demands (4.2 mgd)	✓	✓	✓	✓	✓
Planned non-potable recycled water demands (1.8 mgd)	✓	✓	✓	✓	✓
Additional future non-potable recycled water demands (3.0 mgd)	✓	✓	✓	✓	✓
Spring Valley No. 8 Diversion to South Bay (31.1 mgd)	✓	✓	✓	✓	✓
South Bay indirect potable reuse to Otay Lakes (15.0 mgd)	✓	✓	✓	✓	✓

Note: Flows for non-potable recycled water and indirect potable reuse projects are average annual totals based on the output of the plant. Flows for the Spring Valley diversion are based on 2035 Dry Weather Flows. WRP = Water Reclamation Plant; AWPF = Advanced Water Purification Facility

Summary of Financial Terms Used

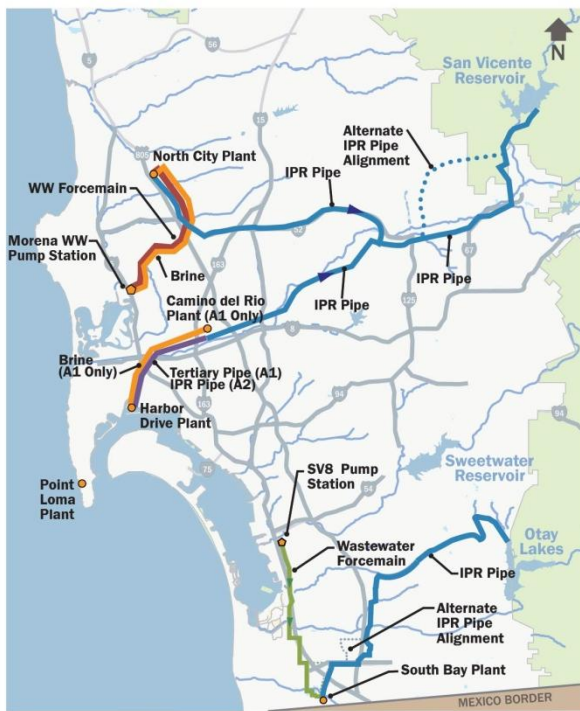
A full description of financial terminology was included previously in this Executive Summary. The following table provides a summary to aid reviewing the Alternative Summary pages that follow.

Cost Level	Description
Gross Costs	Gross costs include the capital and O&M costs for completing and operating the recycled water projects. It does not account for reduced capital and O&M expenses at downstream facilities or other benefits/credits.
Tier 1 Net Costs Direct Wastewater System Savings	With the proposed reuse program, flows to downstream facilities are less, resulting in lower capital and operating costs. Tier 1 shows the reuse cost with these adjustments. (Point Loma Plant, Pump Station 1, Pump Station 2).
Tier 2 Net Costs Salt Reduction Credit	The IPR projects substantially reduce salinity/TDS which lowers operating costs in the downstream water and wastewater systems (there is also a customer benefit treated qualitatively).
Tier 3 Net Costs Indirect Wastewater Savings (CEPT)	The reuse program will reduce mass emissions at Point Loma. This cost tier summaries the net costs if the reuse program contributes to maintaining chemically enhanced primary treatment at Point Loma.

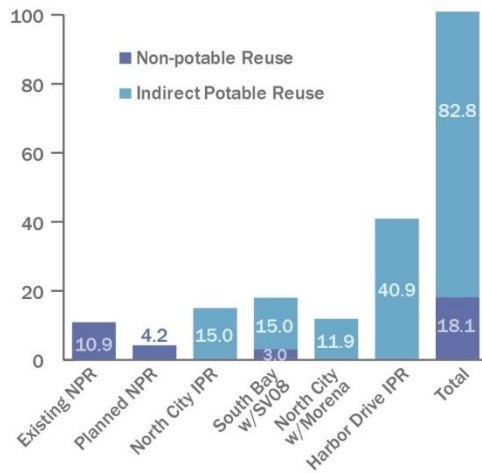


Summary of Integrated Reuse Alternatives A1 and A2

Facility Map



Reuse By Phase



Reuse Per Plant



A1/A2 Allocation of Metro System Flows (2035 Dry Weather Conditions)

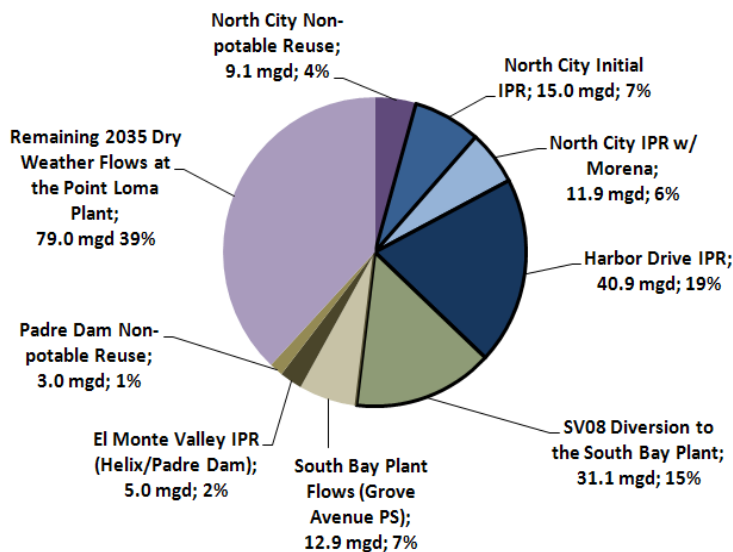


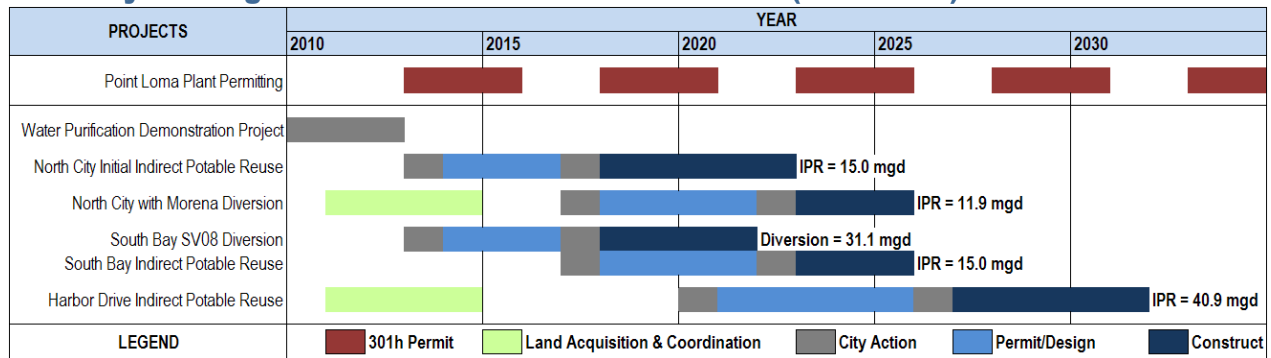
Figure 8-2 Integrated Reuse Alternatives A1 and A2

(upper left) – Displays the facilities included in Alternatives A1 and A2. A1 differs only in that the advanced treatment processes at the Harbor Drive Plant are located at the Camino del Rio site.

(Above) – The charts above includes reuse totals per project and per plant for both non-potable recycled water and indirect potable reuse.

(Left) – The pie chart to the left displays the allocation of Metro System flows estimated for the 2035 dry weather year flow scenario. The black bordered portions represent 99 mgd of offload provided by the facilities included in this Study. Wet weather allocations are presented in Appendix B.

Summary of Integrated Reuse Alternatives A1 and A2 (Continued)



Alternative A1/A2 Implementation Schedule

Note: The planned 21 mgd expansion of South Bay as part of the September 2011 Draft Wastewater Master Plan may allow deferring or eliminating the 26 mgd primary and secondary expansion included in this Study. South Bay plant sizing and capacities shall be coordinated with wastewater planning efforts and Point Loma permit discussions per the implementation steps.

Alternative A1/A2 New Water and Point Loma Offloading (Totals in mgd)								
Start of Operations	New Water (mgd)					Wastewater Offload (mgd)		
	North City	Harbor Drive	Mission Gorge	South Bay	Cumulative	Reuse (N/I South Bay)	Diverted to South Bay	Cumulative
2023	15.0	0.0	-	0.0	15.0	15.0	0.0	15.0
2022	0	0.0	-	0.0	15.0	0.0	31.1	46.1
2026	11.9	0.0	-	0.0	26.9	11.9	0.0	58.0
2026	0.0	0.0	-	18.0	44.9	0.0	0.0	58.0
2032	0.0	40.9	-	0.0	85.8	40.9	0.0	98.9

Note: New water and wastewater offloading totals are based on the reuse projects included in the cost estimates for this Study. The totals do not include the proposed El Monte Groundwater Recharge IPR Project (5 mgd); existing and planned non-potable reuse for the North City Plant (9.1 mgd) and Padre Dam Plant (3.0 mgd); and the Grove Ave. Pump Station (12.9 mgd - which accounts for South Bay non-potable reuse thru 2026). South Bay new water totals include: 15 mgd for IPR and 3 mgd for non-potable reuse (Otay Water District, 2026 to 2040). Point Loma offload totals are based on 2035 Dry Weather Flows. Point Loma offloading due to South Bay is accounted for based on the diversion flows, not the new water created.

Alternative A1/A2 Capital and Annual O&M Costs							
Item		2014 North City initial	2014 South Bay Diversion	2018 Morena	2018 South Bay IPR	2021 Harbor Drive (Alternative A1)	2021 Harbor Drive (Alternative A2)
Incremental Costs	Capital	\$410,700,000	\$20,700,000	\$301,300,000	\$455,400,000	\$1,000,000,000	\$1,012,200,000
	O&M	\$17,600,000	\$300,000	\$13,100,000	\$22,700,000	\$51,000,000	\$50,800,000
Cumulative Costs	Capital	\$410,700,000	\$431,400,000	\$732,800,000	\$1,188,200,000	\$2,188,200,000	\$2,200,400,000
	O&M	\$17,600,000	\$17,900,000	\$31,000,000	\$53,600,000	\$104,700,000	\$104,500,000

Note: Capital & O&M Costs shown above are from the Favorable financial model scenario, and include a 20-percent project contingency.

Alternative A1/A2 Reuse Water Cost Summary (2011 \$/AF)		
Cost Category	Alternative A1	Alternative A2
Gross Costs (Before Avoided Facilities and Other Offset Savings)	\$1,900	\$1,900
Tier 1 Net Costs (With Direct Wastewater System Savings)	\$1,300	\$1,300
Tier 2 Net Costs (With Salt Credit Plus Tier 1 Savings)	\$1,200	\$1,200
Tier 3 Net Costs (With Indirect Wastewater System Savings Plus Tier 1 and Tier 2 Savings)	\$800	\$800
2011 Untreated Imported Water Costs (for comparison purposes)	\$904	\$904

Note: The reuse water cost summary above represents average costs based on the Favorable and Unfavorable financial model scenarios. See Section 8.4 for more details on the financial evaluation and cost descriptions. Tier 1 savings includes wastewater projects no longer necessary due to the reuse projects and offloading included in this Study. Tier 2 savings accounts for savings due to water quality improvements. Tier 3 conceptualizes the savings that could occur if maintaining chemically enhanced primary treatment at the Point Loma Plant was made possible due to the reuse program proposed in this Study. Costs shown above are for comparison of untreated water options, and do not include potable water treatment plant costs.

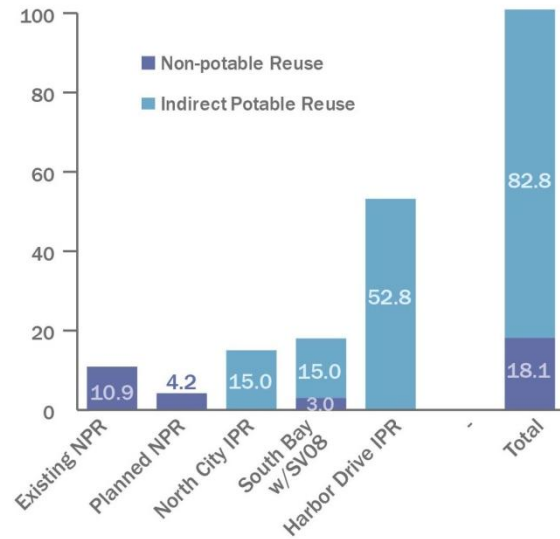


Summary of Integrated Reuse Alternatives B1 and B2

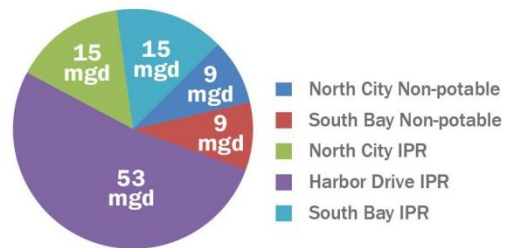
Facility Map



Reuse By Phase



Reuse Per Plant



B1/B2 Allocation of Metro System Flow (2035 Dry Weather Conditions)

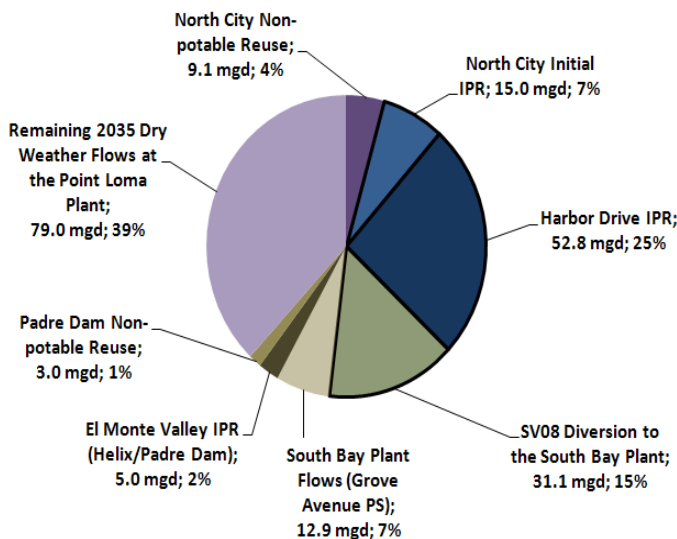


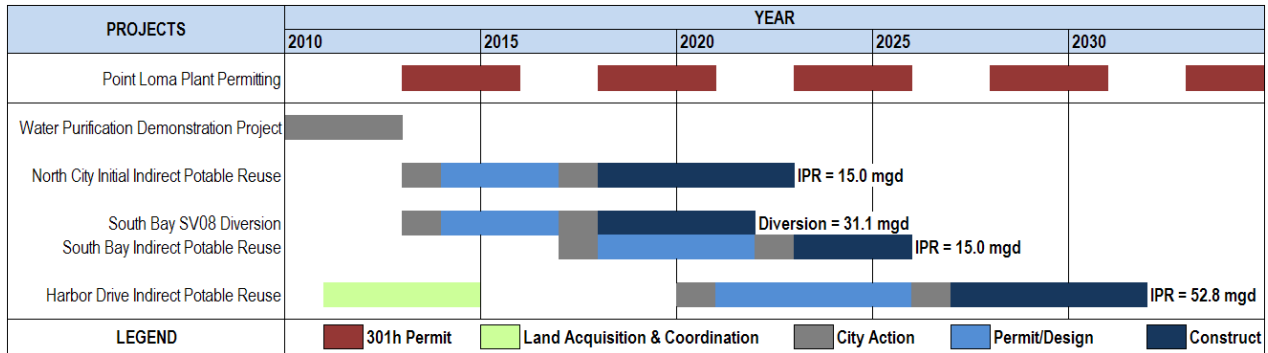
Figure 8-4. Integrated Reuse Alternatives B1 and B2

(upper left) – Displays the facilities included in Alternatives B1 and B2. B1 differs only in that the advanced treatment processes at the Harbor Drive Plant are located at the Camino del Rio site.

(Above) – The charts above includes reuse totals per project and per plant for both non-potable recycled water and indirect potable reuse.

(Left) – The pie chart to the left displays the allocation of Metro System flows estimated for the 2035 dry weather year flow scenario. The black bordered portions represent 99 mgd of offload provided by the facilities included in this Study. Wet weather allocations are presented in Appendix B.

Summary of Integrated Reuse Alternatives B1 and B2 (Continued)



Alternative B1/B2 Implementation Schedule

Note: The planned 21 mgd expansion of South Bay as part of the September 2011 Draft Wastewater Master Plan may allow deferring or eliminating the 26 mgd primary and secondary expansion included in this Study. South Bay plant sizing and capacities shall be coordinated with wastewater planning efforts and Point Loma permit discussions per the implementation steps.

Alternative B1/B2 New Water and Point Loma Offloading (Totals in mgd)								
Start of Operations	New Water (mgd)					Wastewater Offload (mgd)		
	North City	Harbor Drive	Mission Gorge	South Bay	Cumulative	Reuse (N/I South Bay)	Diverted to South Bay	Cumulative
2023	15.0	0.0	-	0.0	15.0	15.0	0.0	15.0
2022	0.0	0.0	-	0.0	15.0	0.0	31.1	46.1
2026	0.0	0.0	-	18.0	33.0	0.0	0.0	46.1
2032	0.0	52.8	-	0.0	85.8	52.8	0.0	98.9

Notes: New water and wastewater offloading totals are based on the reuse projects included in the cost estimates for this Study. The totals do not include the proposed El Monte Groundwater Recharge IPR Project (5 mgd); existing and planned non-potable reuse for the North City Plant (9.1 mgd) and Padre Dam Plant (3.0 mgd); and the Grove Ave. Pump Station (12.9 mgd - which accounts for South Bay non-potable reuse thru 2026). South Bay new water totals include: 15 mgd for IPR and 3 mgd for non-potable reuse (Otay Water District, 2026 to 2040). Point Loma offload totals are based on 2035 Dry Weather Flows. Point Loma offloading due to South Bay is accounted for based on the diversion flows, not the new water created.

Alternative B1/B2 Capital and Annual O&M Costs						
Item		2014	2014	2018	2021	2021
		North City initial	South Bay Diversion	South Bay IPR & 3 mgd non-potable	Harbor Drive (Alternative B1)	Harbor Drive (Alternative B2)
Incremental Costs	Capital	\$340,700,000	\$20,700,000	\$455,400,000	\$1,159,900,000	\$1,168,300,000
	O&M	\$17,300,000	\$300,000	\$22,700,000	\$61,200,000	\$60,500,000
Cumulative Costs	Capital	\$340,700,000	\$361,400,000	\$816,800,000	\$1,976,700,000	\$1,985,100,000
	O&M	\$17,300,000	\$17,600,000	\$40,300,000	\$101,500,000	\$100,800,000

Note: Capital & O&M Costs shown above are from the Favorable financial model scenario, and include a 20-percent project contingency.

Alternative B1/B2 Unit Cost Summary (2011 \$/AF)		
Cost Category	Alternative B1	Alternative B2
Gross Costs (Before Avoided Facilities and Other Offset Savings)	\$1,700	\$1,700
Tier 1 Net Costs (With Direct Wastewater System Savings)	\$1,100	\$1,100
Tier 2 Net Costs (With Salt Credit Plus Tier 1 Savings)	\$1,000	\$1,000
Tier 3 Net Costs (With Indirect Wastewater System Savings Plus Tier 1 and Tier 2 Savings)	\$600	\$600
2011 Untreated Imported Water Costs (for comparison purposes)	\$904	\$904

Note: The reuse water cost summary above represents average costs based on the Favorable and Unfavorable financial model scenarios. See Section 8.4 for more details on the financial evaluation and cost descriptions. Tier 1 savings includes wastewater projects no longer necessary due to the reuse projects and offloading included in this Study. Tier 2 savings accounts for savings due to water quality improvements. Tier 3 conceptualizes the savings that could occur if maintaining chemically enhanced primary treatment at the Point Loma Plant was made possible due to the reuse program proposed in this Study. Costs shown above are for comparison of untreated water options, and do not include potable water treatment plant costs.

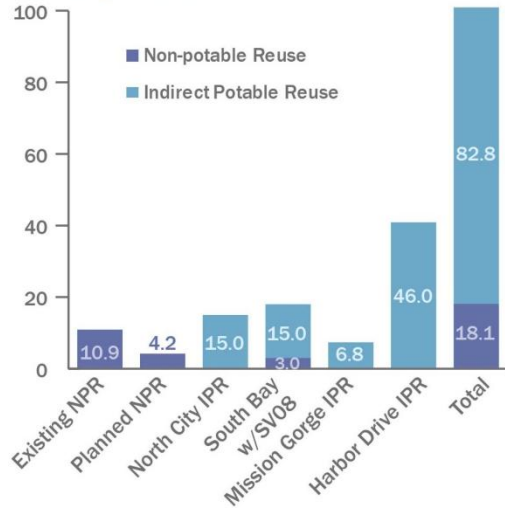


Summary of Integrated Reuse Alternative B3

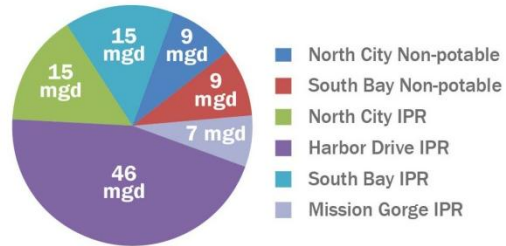
Facility Map



Reuse by Phase



Reuse Per Plant



B3 Allocation of Metro System Flows (2035 Dry Weather Conditions)

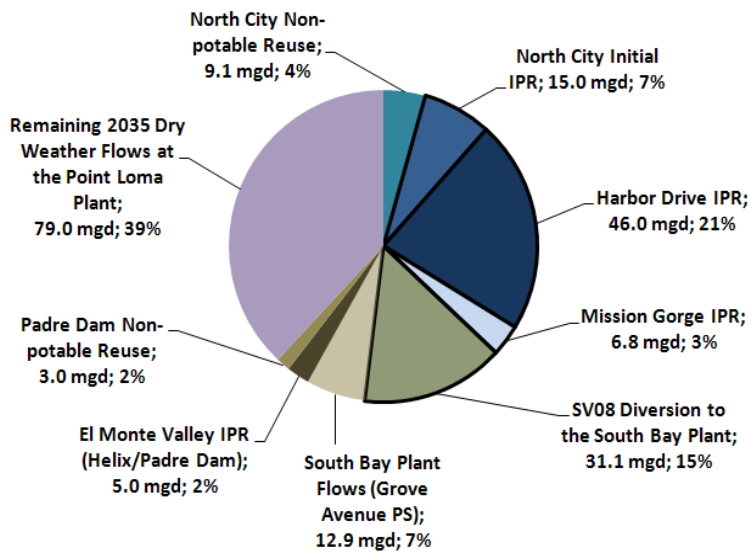


Figure 8-6. Integrated Reuse Alternative B3

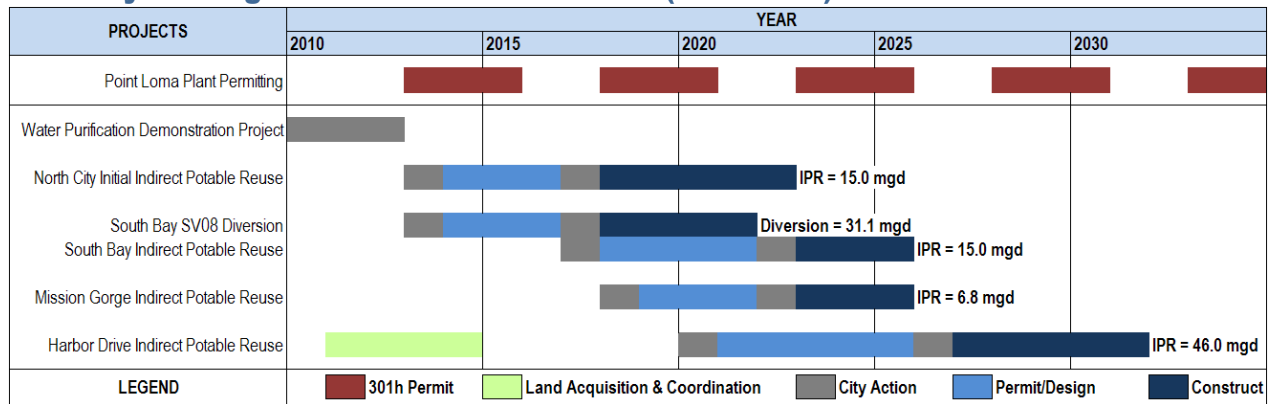
(upper left) – Displays the facilities included in Alternative B3. The Mission Gorge Plant is the only difference between this Alternative and Alternative B2.

(Above) – The charts above includes reuse totals per project and per plant for both non-potable recycled water and indirect potable reuse.

(Left) – The pie chart to the left displays the allocation of Metro System flows estimated for the 2035 dry weather year flow scenario. The black bordered portions represent 99 mgd of offload provided by the facilities included in this Study. Wet weather allocations are presented in Appendix B.



Summary of Integrated Reuse Alternative B3 (Continued)



Alternative B3 Implementation Schedule

Note: The planned 21 mgd expansion of South Bay as part of the September 2011 Draft Wastewater Master Plan may allow deferring or eliminating the 26 mgd primary and secondary expansion included in this Study. South Bay plant sizing and capacities shall be coordinated with wastewater planning efforts and Point Loma permit discussions per the implementation steps.

Alternative B3 New Water and Point Loma Offloading (Totals in mgd)

Start of Operations	New Water (mgd)					Wastewater Offload (mgd)		
	North City	Harbor Drive	Mission Gorge	South Bay	Cumulative	Reuse (N/I South Bay)	Diverted to South Bay	Cumulative
2023	15.0	0.0	0.0	0.0	15.0	15.0	0.0	15.0
2022	0.0	0.0	0.0	0.0	15.0	0.0	31.1	46.1
2026	0.0	0.0	0.0	18.0	33.0	0.0	0.0	46.1
2026	0.0	0.0	6.8	0.0	39.8	6.8	0.0	52.9
2032	0.0	46.0	0.0	0.0	85.8	46.0	0.0	98.9

Note: New water and wastewater offloading totals are based on the reuse projects included in the cost estimates for this Study. The totals do not include the proposed El Monte Groundwater Recharge IPR Project (5 mgd); existing and planned non-potable reuse for the North City Plant (9.1 mgd) and Padre Dam Plant (3.0 mgd); and the Grove Ave. Pump Station (12.9 mgd - which accounts for South Bay non-potable reuse thru 2026). South Bay new water totals include: 15 mgd for IPR and 3 mgd for non-potable reuse (Otay Water District, 2026 to 2040). Point Loma offload totals are based on 2035 Dry Weather Flows. Point Loma offloading due to South Bay is accounted for based on the diversion flows, not the new water created.

Alternative B3 Capital and Annual O&M Costs

Item	2014	2014	2018	2019	2021	
	North City initial	South Bay Diversion	South Bay IPR & 3 mgd non-potable	Mission Gorge	Harbor Drive	
Incremental Costs	Capital	\$332,600,000	\$20,700,000	\$455,400,000	\$279,000,000	\$1,073,200,000
	O&M	\$17,300,000	\$300,000	\$22,700,000	\$13,500,000	\$55,000,000
Cumulative Costs	Cumulative Capital Cost	\$332,600,000	\$353,400,000	\$808,800,000	\$1,087,800,000	\$2,160,900,000
	Cumulative O&M Cost	\$17,300,000	\$17,600,000	\$40,300,000	\$53,700,000	\$108,700,000

Note: Capital & O&M Costs shown above are from the Favorable financial model scenario, and include a 20-percent project contingency.

Alternative B3 Unit Cost Summary (2011 \$/AF)

Cost Category	Alternative B3
Gross Costs (Before Avoided Facilities and Other Offset Savings)	\$1,900
Tier 1 Net Costs (With Direct Wastewater System Savings)	\$1,300
Tier 2 Net Costs (With Salt Credit Plus Tier 1 Savings)	\$1,200
Tier 3 Net Costs (With Indirect Wastewater System Savings Plus Tier 1 and Tier 2 Savings)	\$800
2011 Untreated Imported Water Costs (for comparison purposes)	\$904

Note: The reuse water cost summary above represents average costs based on the Favorable and Unfavorable financial model scenarios. See Section 8.4 for more details on the financial evaluation and cost descriptions. Tier 1 savings includes wastewater projects no longer necessary due to the reuse projects and offloading included in this Study. Tier 2 savings accounts for savings due to water quality improvements. Tier 3 conceptualizes the savings that could occur if maintaining chemically enhanced primary treatment at the Point Loma Plant was made possible due to the reuse program proposed in this Study. Costs shown above are for comparison of untreated water options, and do not include potable water treatment plant costs.



What are the Alternative Costs and How Do They Compare with Other Water Supply Costs?

The Integrated Reuse Alternative costs are summarized in the table below. The table includes a tiered breakout of summary level costs based on the Gross Costs and Net Costs categories described earlier in this Executive Summary. As shown, the costs for A1, A2 and B3 are nearly identical to each other, and slightly higher than B1 and B2. For the A1/A2 comparison to B1/B2, the increased costs occur mainly due to the additional wastewater facilities and pumping needed to divert flows from Morena to the North City Plant. For the B3 comparison to B1/B2, B3 adds an additional plant and does not have the same economy of scale that the B1 and B2 Alternatives have. Implementation steps are included later in this Chapter, which include steps to further develop the Alternatives and look for additional cost savings.

Cost Summary (2011 \$/AF)				
Alternative	Average Gross Costs	Net Costs		
		Tier 1 - Direct Wastewater System Savings	Tier 2 - Salt Reduction Credit	Tier 3 - Indirect Wastewater System Savings
		<i>Remaining Point Loma capacity upgraded to Secondary</i>	<i>Water Quality Benefit to Water/Wastewater System</i>	<i>Remaining Point Loma capacity maintained at CEPT</i>
A1: North City 45 mgd; Split Harbor Dr. AWWPF	\$1,900	\$1,300	\$1,200	\$800
A2: North City 45 mgd; Consolidated Harbor Dr. AWWPF	\$1,900	\$1,300	\$1,200	\$800
B1: North City 30 mgd; Split Harbor Dr. AWWPF	\$1,700	\$1,100	\$1,000	\$600
B2: North City 30 mgd; Consolidated Harbor Dr. AWWPF	\$1,700	\$1,100	\$1,000	\$600
B3: North City 30 mgd; Consolidated Harbor Dr. AWWPF; Mission Gorge AWWPF	\$1,900	\$1,300	\$1,200	\$800

Notes:

- All Alternatives include South Bay Option C2 expansion with the Spring Valley No. 8 Diversion
- Direct and indirect wastewater system savings based on a comparison between the City's September 2011 Draft Wastewater Master Plan and the reduced wastewater facility sizing and pumping required as a result of the projects included in this Recycled Water Study (see Appendix H).
- Totals are in 2011 dollars (ENR Los Angeles Index value of 10,051.30, June 2011) and are based on a net present value analysis using a detailed financial model.
- Financial model sensitivity analysis generally produced cost ranging +/- \$200/AF of the values shown. Favorable conditions could result in lower costs than shown.

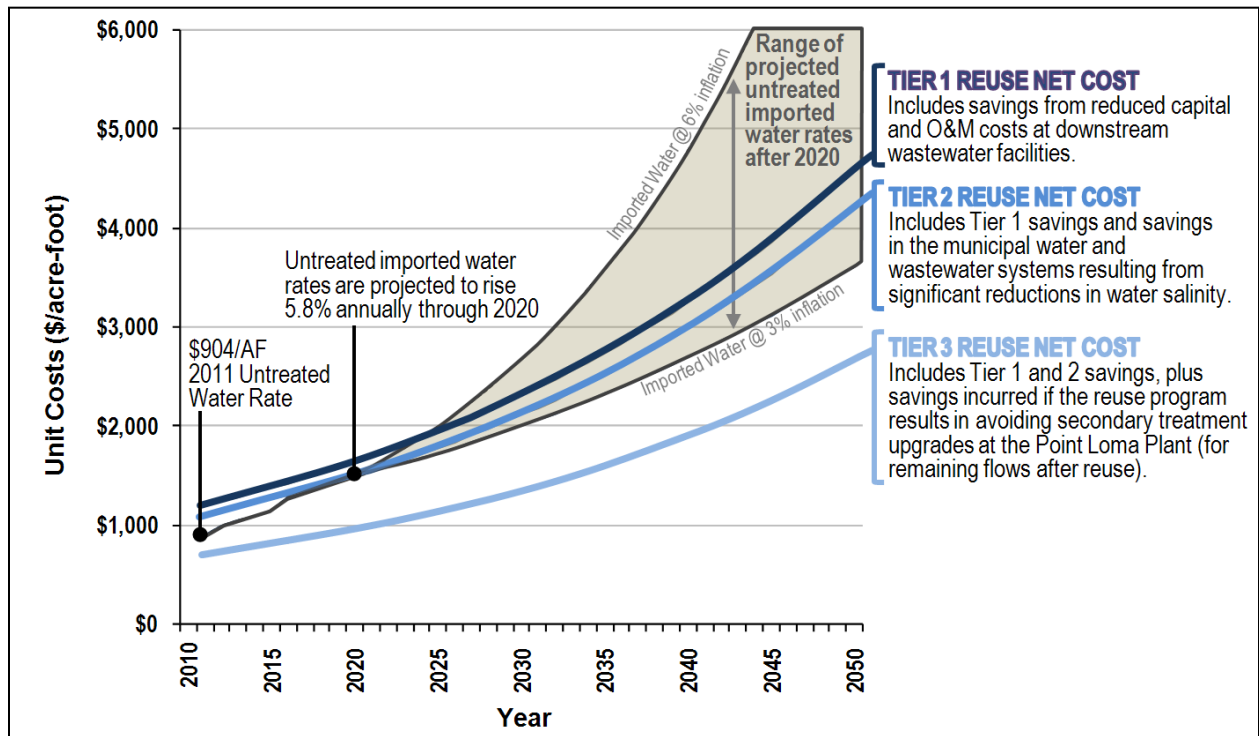
Key Study Conclusion

The Alternative Net Costs represent the costs that should be compared to other water sources – particularly imported untreated water. The average costs of the Alternatives above are:

- Cost assuming direct wastewater savings = \$1,200/AF
- Cost assuming above plus salt credit = \$1,100/AF
- Cost assuming above plus indirect wastewater savings = \$700/AF

These costs compare well to the 2011 untreated water cost of \$904 per acre foot, and are more economical than most other new water supply concepts being proposed.

The Study Alternative’s Net Costs were extrapolated based on a 3.5-percent inflation rate and compared to projected imported untreated water rate as shown in the figure below. The 2011 SDCWA municipal and industrial untreated water rate for the City was \$904 per acre foot. The existing rate was inflated through 2020 based on the “low-rate” scenario values provided by the SDCWA in April 2011 (which averages to a 5.8-percent annual increase). Beyond 2020, the untreated water cost projections were bracketed based on various inflation scenarios ranging from 3 to 6 percent (shown as the shaded area). These scenarios compare well to the Net Costs of the Study’s Alternatives (shown as solid lines). The Study’s Net Costs shown are the average of all the Study Alternatives and an average of the Favorable and Unfavorable scenario (i.e., the lower cost B1/B2 Alternatives and the favorable scenario would lower the reuse costs further). As shown, the average Tier 1 and Tier 2 cost curves have Net Costs lower than most untreated imported water rate scenarios. If the Tier 3 savings are attributed to the projects in this Study, the program would have significantly lower Net Costs than all untreated imported water rate scenarios. An additional consideration is the long-term effects that other local water projects and reduced demands are causing to MWD/SDCWA rates. As purchases decline, rates must increase to cover fixed costs. This is likely to cause imported water costs to inflate faster than locally controlled projects. Overall, the conclusion of this analysis supports the water reuse program proposed in this Study.



Comparison of the Study’s Unit Costs for New Water to the Cost of Imported Untreated Water

The Integrated Reuse Alternative Net Costs compare well to projected untreated imported water rates. Untreated water rates are projected to rise 5.8 percent through 2020 and there remain many uncertainties regarding future costs associated with the Bay-Delta fix and imported water.



What Were the Other Considerations for Each Alternative?

The Integrated Reuse Alternatives were evaluated during the Fine Screening Session and subsequent Stakeholder Status Update Meetings. Each Integrated Reuse Alternative provides common and distinct benefits, as summarized below.

Integrated Reuse Alternative Comparative Summary					
Alternative	Institutional Complexity	Technical Complexity	Number of Treatment Plants	Number of Wastewater Diversions	Key Infrastructure Siting and Complexity Considerations
A1	Med	High (Morena Diversion/Split Plant Harbor Drive-Camino del Rio)	4 North City, South Bay, Harbor Drive (WRP) w/ Camino del Rio (AWPF)	2	<ul style="list-style-type: none"> • Smallest area requirement at the Harbor Drive site • Challenging siting at Camino del Rio site • Challenging siting and operation of the Morena Wastewater Diversion Pump Station • Most pumping of all alternatives due to Morena Diversion • Increased costs due to added brine line
A2	Med	Med/High (Morena Diversion)	3 North City, South Bay Harbor Drive	2	<ul style="list-style-type: none"> • Reduced Harbor Drive Plant siting needs compared to the "B" alternatives • Challenging siting and operation of the Morena Wastewater Diversion Pump Station
B1	Med	Med/High (split Plant Harbor Drive-Camino del Rio)	4 North City, South Bay, Harbor Drive (WRP) w/ Camino del Rio (AWPF)	1	<ul style="list-style-type: none"> • Reduced Harbor Drive Plant siting needs compared to B2 • Minimal wastewater pumping • Challenging siting at the Camino del Rio site • Reduced ability to phase • Increased costs due to added brine line
B2	Med	Med	3 North City, South Bay, Harbor Drive	1	<ul style="list-style-type: none"> • Largest area requirement at the Harbor Drive site • Least cost option • Minimal wastewater and tertiary water pumping • Reduced ability to phase
B3	High (Harbor Drive site & Mission Gorge site)	High (4th Water Reclamation Plant/ Advance Water Purification Facility at Mission Gorge)	4 North City, South Bay, Harbor Drive, Mission Gorge	1	<ul style="list-style-type: none"> • Multiple agency collaboration could drive further economy of scale benefits • Allows for additional phasing opportunities • Closest plant to San Vicente Reservoir reduces overall pumping • Mission Gorge site requires interagency agreements and administration costs • Mission Gorge Plant is relatively small due to limited tributary wastewater flows. It does not have an economy of scale benefit and reduces some economy of scale benefit at the Harbor Drive Plant • Larger upstream treatment at Mission Gorge Plant impacts downstream water quality at Harbor Drive Plant • Reduced flows/concentrated waste downstream of Mission Gorge Plant may create maintenance issues

Notes:

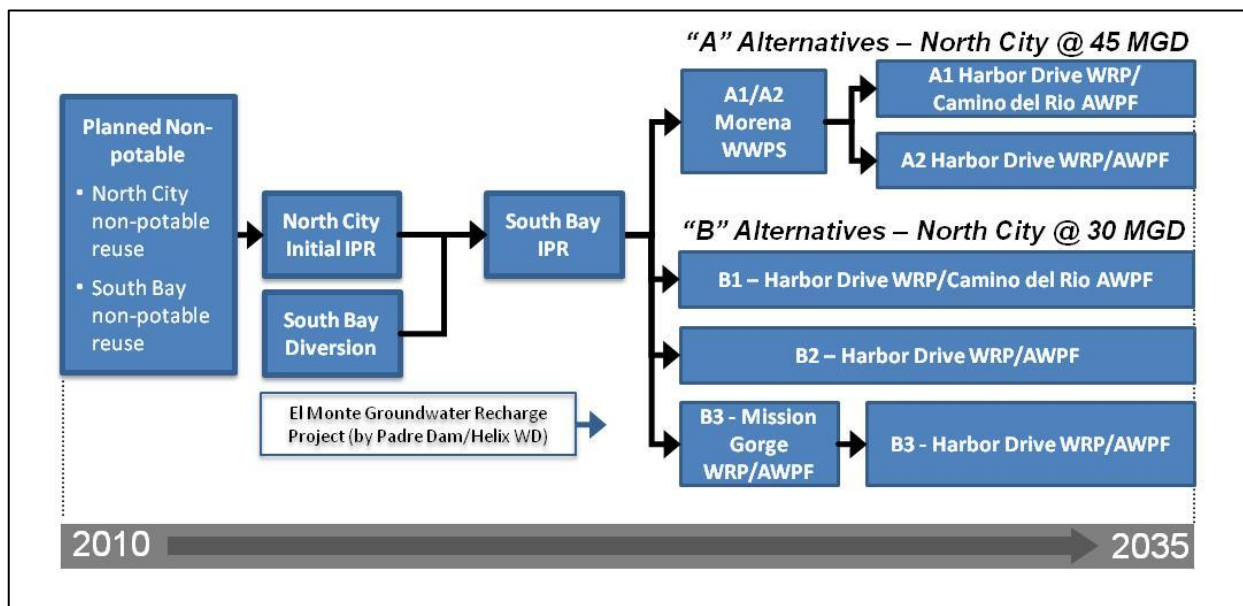
- Alternative A1 and B1 include a split Harbor Drive Plant at the Harbor Drive site and Camino del Rio site. Although these facilities work together, they were considered separate treatment plant sites in the table above.
- Wastewater Diversions can include the Morena diversion to the North City Plant and the Spring Valley No. 8 Diversion to the South Bay Plant. These diversions require wastewater pump stations.
- South Bay facilities not included above since common to all Alternatives.

Why is Adaptability Important?

The implementation of this reuse plan will need to be adaptable to anticipated and unanticipated needs. Adaptability may be triggered based on financial constraints, changes in regulatory requirements, institutional coordination issues, favorable or unfavorable political and community support, and technical issues. The project implementation proposed below provides a number of key actions to help implement this reuse program and maximize adaptability to changing conditions.

How Will the Projects be Implemented?

Implementing the Integrated Reuse Alternatives involves a step-by-step process as shown in the figure below. Although part of the implementation process includes common elements regardless of the alternative, it is important to note that the latter steps are affected by these earlier phase projects. Therefore, implementation considerations are important even during the first phase projects.



Recycled Water Study Project Implementation Summary
 The implementation plan summarizes the basic roadmap to complete the reuse plan.

What are Specific Implementation Steps Needed Directly Following this Study?

Achieving the benefits identified in this Study requires an investment. Some of these investments have already been started, such as the Water Purification Demonstration Project now operating at the North City Plant. To proceed to the next steps in this study, additional investments will be needed to plan and develop the program to a level of detail that can be designed, permitted and constructed. These investments are referred to as program implementation steps. The following pages organize and summarize these key implementation steps into an Implementation Checklist.



IMPLEMENTATION CHECKLIST: REGULATORY, INSTITUTIONAL, POLICY & FINANCE

General

- Develop timeline for implementation steps outlined below.

Water Purification Demonstration Project/Permitting. The Water Purification Demonstration Project (Demonstration Project) and the San Vicente flow modeling are key steps of the public involvement and regulatory permitting processes to confirm the health and safety of the new water supply.

- Obtain Advanced Water Purification Facility water quality and San Vicente limnology model final results.
- Provide on-going public involvement and community outreach.
- Coordinate with CDPH and the Regional Water Quality Control Board on processes and permitting (whether through uniform criteria being developed by CDPH or project specific criteria).
- Promote advocacy by Stakeholder groups with CDPH and the Regional Water Quality Control Board.

Mayor and City Council. Support from the Mayor and City Council is essential to implement such an important program. While the reuse program appears to offer substantial cost savings to ratepayers (compared to upgrading the Point Loma Plant for the full-scale flows), support from policymakers to advance the program will be needed.

- Obtain Independent Rates Oversight Committee support.
- Obtain Natural Resources and Culture Committee approval.
- Obtain stakeholder advocacy support of the Study by the Metro JPA, Independent Rates Oversight Committee, environmental groups, and other interested parties.
- Obtain City Council approval.
- Coordinate implementation with broader water policy issues and programs.

Metro JPA Approval. As partners in the Metro System, support from the Metro JPA is also essential to implement such an important program. Support from JPA policymakers is needed to advance the program.

- Finalize the cost sharing framework, as summarized below. This includes policy and legal issues, costs and consensus.
- Promote stakeholder advocacy in support of the Study by the City, Independent Rates Oversight Committee, environmental groups, and other interested parties.
- Obtain Policymaker support and accept the Study and the reuse program.

Financials/Policy. Fiscal responsibility is important for all parties. For Water and Wastewater ratepayers, there is an important choice required regarding whether to fund this water reuse plan or potentially fund full-scale improvements at the Point Loma Plant.

- Complete discussions on cost share framework concepts and agreements, clarify City and Participating Agency costs, and clarify sources for offset such as the salt credit.
- Provide comparative financial analyses with other alternative water sources (if desired).
- Determine/develop policy on local resource program funding from SDCWA/MWD.
- Determine SDCWA policy on regional supply benefits, interest in joint participation, and potential rate impacts/savings.
- Seek out and apply for grants.
- Develop rate impacts and a detailed financing plan.
- Provide funding and staff to move forward with the program implementation, including the activities needed for near-term and long-term projects.
- Develop policy on SBx7-7 stemming from new locally produced water supply.

IMPLEMENTATION CHECKLIST: PERMITTING & TECHNICAL

Permitting. Implementing the reuse plan will require addressing key permitting activities:

- Point Loma Permitting. Continue permitting coordination amongst Stakeholders as part of the Point Loma Plant 301(h) Modified Permit process. These discussions are assumed to be related to the cost sharing discussions outlined above.
- Project Permitting. Identify, evaluate and obtain permits needed to complete the reuse projects.

Technical/Other. Implementing the reuse plan will require technical evaluations and engineering:

- Reuse Program/wastewater planning process coordination. On-going coordination between the proposed reuse program and wastewater planning efforts to refine facilities and costs in support of the cost sharing discussions and Point Loma permitting process.
- North City treatment. Determine the North City treatment approach (existing filters, feed source, recovery rates, improvements to the treatment processes upstream of the filters, the fate of the electro dialysis reversal units, and other technical design parameters).
- Non-potable reuse demands and wastewater flow confirmation. Continue to evaluate non-potable reuse demands and use trends; and wastewater flow generation. These totals will be important to finalize the size of indirect potable reuse projects.
- New facility siting. Develop detailed siting studies for new pump stations and treatment plants, including evaluation and confirmation of availability of the Harbor Drive and Camino del Rio sites.
- Wastewater treatment pilot testing. Test treatment strategies and high rate systems to develop area-specific design values.
- New conveyance facility alignments. Perform alignment studies for new conveyance facilities.
- SV8 Diversion to South Bay. Update the SV8 Pump Station Predesign and Sweetwater River crossing. Coordinate efforts between the Recycled Water Study needs and the September 2011 Draft Wastewater Master Plan (or any updates) needs.
- South Bay Plant. Continue discussion and coordination on South Bay Plant issues, particularly sizing and timing needed for reuse based on recent revisions to the September 2011 Draft Wastewater Master Plan. Key coordination issues include South Bay timing (both from reuse and wastewater perspectives), and the biosolids approach strategy. This includes evaluating/determining whether biosolids will be treated at the South Bay Plant at a dedicated facility instead of continuing to send it to the Point Loma Plant and the MBC for treatment. These coordination items will aid in determining cost responsibilities as outlined in the financial implementation steps above.
- South Bay indirect potable reuse delivery. Perform detailed evaluation of the South Bay Plant expansion including pump station and delivery pipeline to Otay Lakes.
- Otay Lakes operation. Perform an Otay Lakes operational evaluation in relation to local runoff and indirect potable reuse operation to confirm flow rates and optimal project sizing. Develop a hydraulic model similar to those developed for the San Vicente Reservoir to determine seasonal hydraulic patterns within the Otay Lakes system.
- Joint Project Evaluation. Identify opportunities of joint projects, such as brine pipelines or indirect potable reuse delivery pipelines coordinated with other regional projects.

IMPLEMENTATION CHECKLIST: PERMITTING & TECHNICAL (Continued)

- Mission Gorge Plant Evaluations. Coordinate further discussion and evaluation on the merits of a joint plant with Padre Dam Municipal Water District in the Mission Gorge area (conceptualized in Alternative B3). Evaluate possible additional savings at the East Mission Gorge Pump Station and additional avoided facility savings in downstream facilities.
- Groundwater updates. Complete groundwater studies including evaluation of the San Diego Formation and San Diego River system for possible inclusion into future master planning efforts. Update the status of other County groundwater studies including San Pasqual and Padre Dam Municipal Water District's studies.
- Waste stream recovery. Evaluate waste stream efficiency and recovery analysis to evaluate ways to further minimize waste streams and explore beneficial uses.
- San Vicente regulatory limits and operational coordination. Perform San Vicente analysis to evaluate maximum potential indirect potable reuse. If it is limited, determine options such as further evaluation of the San Diego formation or integration with other reservoirs. Coordinate reuse operational activities with other San Vicente operations after the dam raise is complete.
- Regulatory update on minimum reservoir capacities. Check assumptions on smaller sized reservoirs (Lakes Murray, Miramar and Jennings) once indirect potable reuse reservoir augmentation regulations are finalized.
- SDCWA Coordination. Coordinate with SDCWA on their Master Plan (currently underway), broader water policy support at the state level, and possible regional collaboration involving funding.
- Peak Wet Weather Flow strategies. Continue to evaluate fail-safe disposal strategies under wet weather conditions, including equalization, live stream discharge, and CEPT-secondary effluent blending at the Point Loma Plant.
- Santee Basin Aquifer Project. Continue to evaluate this project which is currently under study by the Bureau of Reclamation for Padre Dam Municipal Water District. Preliminary planning numbers put the capacity of the first site considered to be between 1.5 mgd and 3 mgd of groundwater recharge capacity.
- Helix Water District IPR Project. Continue to evaluate this project where Helix Water District is considering an option to send advanced treated recycled water to Lake Jennings Reservoir as part of a reservoir augmentation IPR project.

Study Results and Conclusions

The overarching goal of the Recycled Water Study (Study) was to evaluate ways to increase water reuse as a means of providing safe, reliable water supplies; to reduce ocean discharges; and to offload the Point Loma Plant. Over the course of the Study, representatives from the Study area's water and wastewater agencies, environmental groups, a representative from the Independent Rates Oversight Committee and independent technical reviewers participated in developing the water reuse program outlined below. These Stakeholders provided valuable opinions and diverse viewpoints that added value to the process and the alternatives developed. Overall, the Integrated Reuse Alternatives presented achieve the Study's goals, provide a bold vision for future water reuse, and provide savings to ratepayers. While water reuse has been evolving in San Diego over the past few decades, the region's master plans have helped guide decision makers with a focus on making good investments, while still being flexible to adapt to future changes. This Study endeavors to continue this tradition and be looked upon as a milestone that helped provide long-term water sustainability to the San Diego region.

What are the Primary Study Results?

Alternatives. Five Integrated Reuse Alternatives were developed based on an extensive, interactive Stakeholder process. Each Alternative includes 83 mgd of new indirect potable reuse and 3 mgd of new non-potable recycled (in addition to 4 mgd of already planned non-potable reuse).

Costs. The 2011 Net Cost results for the Alternatives in this Study represent the costs that should be compared to other water sources – particularly imported untreated water. The average Net Costs are:

- Net Cost assuming direct wastewater savings = \$1,200/AF
- Net Cost assuming above plus salt credit = \$1,100/AF
- Net Cost assuming above plus indirect wastewater savings = \$700/AF

What are the Primary Study Conclusions?

Achieves Favorable Water Costs. The reuse costs above are comparable to 2011 untreated imported water delivery costs of \$904/AF, and are projected to be more economical than future water costs. Imported water costs have risen substantially in the past decade and this trend is projected to continue into the foreseeable future. Therefore, this new water supply will provide safe, affordable water for existing and future generations of San Diegans.

Provides Reliability and Local Control. The new reuse supply reduces the region's reliance on imported water and increases local water supply reliability. Local reuse is considered an uninterruptable water source – an important trait since our imported water supply crosses great distances and major earthquake faults.

Enhances Sustainability. The reuse solutions are more sustainable and environmentally friendly. They reduce importing water from Northern California and the Colorado River, lowering energy usage and our overall carbon footprint.

Improves Water Quality. The reuse solutions produce additional water quality benefits such as significant regional salinity reductions. Ratepayers will see reduced salinity in the water – appliances, water heaters and fixtures will last longer. In addition, ocean discharges are reduced resulting in ocean water quality benefits.

Empowers Long-term Cost Control. The solutions increase the City and Participating Agencies' ability to control long-term water and wastewater costs by reducing liability for pending issues such as the California Bay-Delta fix and costly wastewater treatment upgrades.

Supported by Stakeholders. The solutions are supported by rate oversight and environmental group Stakeholder representatives.



Where Can I Find More Information on Water Reuse in the City?



Website. The Public Utilities Department maintains useful information on the City's website. See below for more information.

Recycled Water Home Page. The City's Recycled Water homepage includes extensive information on water reuse, rules and regulations, information on the existing system, and frequently asked questions. The website address is: <http://www.sandiego.gov/water/recycled/>



Water Reuse Homepage. The Water Reuse homepage includes links to the 2005 Water Reuse Study, the Water Purification Demonstration Project, and the Full Scale Reservoir Augmentation Page. The website address is: <http://www.sandiego.gov/water/waterreuse/>

General Information. If you are interested in learning more about recycled water, the City's Public Utilities Department can be contacted at (619) 533-7572 or e-mail at water@sandiego.gov.

Community Presentations. Recycled water professionals are available to speak to your community group, organization, special interest club or service organization. They are qualified to deliver their expertise, answer your recycled water questions, and will customize a presentation to meet the needs of your group. To schedule a speaker, simply call our Speakers Bureau Hotline at (619) 533-6638 at least two weeks prior to your program date. Or, you may e-mail requests to waterspeakers@sandiego.gov.

Who Can I Contact for More Information on this Study?

The project team consisted of City staff from the Public Utilities Department, and a consulting team from Brown and Caldwell, Black & Veatch, and CDM.



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COOPERATIVE AGREEMENT

This Cooperative Agreement ("Agreement") is entered into this 17th day of ~~January~~ ^{February}, 2009, by and between San Diego Coastkeeper ("Coastkeeper"), the San Diego Chapter of Surfrider Foundation ("Surfrider"), and the City of San Diego (the "City"), a municipal corporation, individually referred to herein as "Party" and collectively as "Parties."

RECITALS

- A. Whereas, Coastkeeper and Surfrider have expressed concern over the City's application for a variance from secondary treatment requirements at the Point Loma Wastewater Treatment Plant (the "Waiver") and have litigated past Waiver issuances; and,
- B. Whereas, Coastkeeper and Surfrider have proposed that the City take a long-term view of its wastewater treatment and conveyance infrastructure and conduct a study to identify opportunities to increase recycling of wastewater and minimize discharges of treated sewage from the Point Loma Wastewater Treatment Plant; and,
- C. Whereas, by letter dated December 2, 2008, Region IX of the United States Environmental Protection Agency (the "EPA") tentatively approved the City's application for a Waiver under sections 301(h) and 301(j)(5) of the Clean Water Act; and,
- D. Whereas, the EPA's tentative decision indicates the City needs to pursue additional water reclamation and reuse projects, including those which demand a year-round supply of reclaimed water, to maintain long term compliance with mass emission permit limits for suspended solids; and,
- E. Whereas, the City, Coastkeeper and Surfrider recognize that studying the possibility of significantly reducing wastewater flows to the Point Loma Wastewater Treatment Plant and increasing wastewater recycling could benefit San Diego residents and the environment, and the Parties desire to cooperate in investigation of these opportunities; and,
- F. Whereas, in consideration of these recitals and for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the City, Coastkeeper, and Surfrider hereby set forth their mutual covenants and understandings as follows:

AGREEMENT

ARTICLE I - CITY'S RESPONSIBILITIES

1.1 **Study of Wastewater Recycling - Scope of Work.** The City shall, in coordination with Coastkeeper and Surfrider, prepare and execute a Scope of Work for the preparation of a city-wide assessment ("Study") of its wastewater collection and treatment system. The goal of the Study shall be to identify opportunities within the City's system to maximize recycling and reclamation of wastewater for potable and non-potable uses. The Scope of Work shall at a

EXHIBIT NO. 15
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CC-56-09

Surfrider from making substantive recommendations to any regulatory agency for strengthening the monitoring provisions of the Permit. Should such recommendation contribute towards any regulatory agency materially and significantly alter the terms of the Permit, the City may exercise its right to suspend or terminate this Agreement pursuant to Section 3.2.

2.2 Other Assistance. Coastkeeper and Surfrider shall attend meetings, communicate with the City, select an expert and provide any other assistance necessary for the City to complete its obligations as set forth in Article I above.

ARTICLE III – SUSPENSION AND TERMINATION

3.1 Third Party Litigation. In the event any person, organization, or other third party initiates litigation, an administrative appeal, or other action challenging the EPA's or a State agency's decision to approve the Waiver, the City may, in its sole discretion, suspend or terminate this Agreement at any time while such litigation, appeal or other action is pending. The City shall provide advance notice of the suspension or termination in writing to Coastkeeper and Surfrider, specifying the period of suspension or the effective date of termination, as applicable.

3.2 Modification of Proposed Permit Conditions. In the event the EPA or a State agency materially and significantly modifies or alters the Permit conditions in the EPA's tentative decision, the City may, in its sole discretion, suspend or terminate this Agreement. The City shall provide advance notice of the suspension or termination in writing to Coastkeeper and Surfrider, specifying the period of suspension or the effective date of termination, as applicable.

3.3 Extension of Time. If this Agreement is suspended pursuant to this Article, the time for completion of the Scope of Work and the Study shall be extended by the length of time of the suspension unless otherwise agreed to in writing by the Parties.

ARTICLE IV – OTHER CONDITIONS

4.1 Effective Date. This Agreement is subject to the approval of the Mayor and City Council. The obligations of the City, Coastkeeper, and Surfrider shall not become effective until such approval is received and this Agreement is fully executed by all Parties.

4.2 Future Obligations. The City is not obligated to implement any projects, studies, operational changes or other recommendations that may arise from completion of the Study or any reports issued thereunder. The City retains sole discretion to implement any or none of the recommendations of the study.

ARTICLE V - MEDIATION

5.1 Mandatory Non-binding Mediation. If a dispute arises out of, or relates to this Agreement, or the breach thereof, and if said dispute cannot be settled through normal contract

action in third parties is unintended, and any such third party beneficiary is hereby expressly disclaimed.

6.4 Jurisdiction and Venue. The venue for any suit or proceeding concerning this Agreement, the interpretation or application of any of its terms, or any related disputes shall be in the County of San Diego, State of California.

6.5 Successors in Interest. This Agreement and all rights and obligations created by this Agreement shall be in force and effect whether or not any Parties to the Agreement have been succeeded by another entity, and all rights and obligations created by this Agreement shall be vested and binding on any Party's successor in interest.

6.6 Integration. This Agreement and the Exhibits and references incorporated into this Agreement fully express all understandings of the Parties concerning the matters covered in this Agreement. No change, alteration, or modification of the terms or conditions of this Agreement, and no verbal understanding of the Parties, their officers, agents, or employees shall be valid unless made in the form of a written amendment to this Agreement agreed to by both Parties. All prior negotiations and agreements are merged into this Agreement.

6.7 Counterparts. This Agreement may be executed in counterparts, which when taken together shall constitute a single signed original as though all Parties had executed the same page.

6.8 No Waiver. No failure of the City, Coastkeeper, or Surfrider to insist upon the strict performance by the other of any covenant, term or condition of this Agreement, nor any failure to exercise any right or remedy consequent upon a breach of any covenant, term, or condition of this Agreement, shall constitute a waiver of any such breach of such covenant, term or condition. No waiver of any breach shall affect or alter this Agreement, and each and every covenant, condition, and term hereof shall continue in full force and effect to any existing or subsequent breach.

6.9 Municipal Powers. Nothing contained in this Agreement shall be construed as a limitation upon the powers of the City as a chartered city of the State of California.

6.10 Drafting Ambiguities. The Parties agree that they are aware that they have the right to be advised by counsel with respect to the negotiations, terms and conditions of this Agreement, and the decision of whether or not to seek advice of counsel with respect to this Agreement is a decision which is the sole responsibility of each Party. This Agreement shall not be construed in favor of or against either Party by reason of the extent to which each Party participated in the drafting of the Agreement.

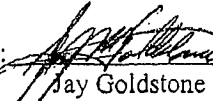
6.11 Conflicts Between Terms. If an apparent conflict or inconsistency exists between the main body of this Agreement and the Exhibits, the main body of this Agreement shall control. If a conflict exists between an applicable federal, state, or local law, rule, regulation, order, or code and this agreement, the law, rule, regulation, order, or code shall control. Varying degrees of stringency among the main body of this agreement, the Exhibits, and laws, rules, regulations, orders, or codes are not deemed conflicts, and the most stringent requirement shall control. Each

IN WITNESS WHEREOF, this Agreement is executed by the City of San Diego, acting by and through its Mayor or his designee, pursuant to City Council Resolution No. R-304617 authorizing such execution, by San Diego Coastkeeper, and by the San Diego Chapter of Surfrider Foundation.

SAN DIEGO COASTKEEPER

CITY OF SAN DIEGO

By: 
Bruce Reznik
Executive Director


By: 
Jay Goldstone
Chief Operating Officer

Date: January 30, 2009

Date: 2/17/09

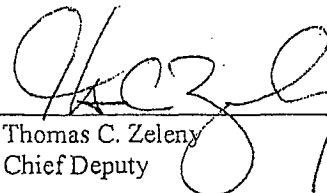
SURFRIDER FOUNDATION
SAN DIEGO CHAPTER

I HEREBY APPROVE the form and legality of the foregoing agreement this 18 day of February, 2009.

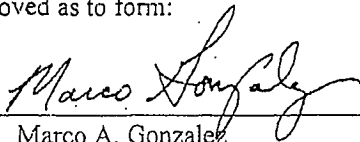
By: 
Scott Harrison
Executive Committee Chairman

JAN I. GOLDSMITH, City Attorney

Date: 3 FEB 2009

By: 
Thomas C. Zeleny
Chief Deputy

Approved as to form:

By: 
Marco A. Gonzalez
Coast Law Group LLP
Attorney for Coastkeeper and Surfrider

RESOLUTION NUMBER R-304617

DATE OF FINAL PASSAGE _____

A RESOLUTION OF THE CITY COUNCIL AUTHORIZING
NEGOTIATION AND EXECUTION OF A COOPERATIVE
AGREEMENT WITH SAN DIEGO COASTKEEPER AND
THE SAN DIEGO CHAPTER OF SURFRIDER FOUNDATION;
AND TAKING RELATED ACTIONS.

BE IT RESOLVED, by the Council of the City of San Diego, that the Mayor or his designee is authorized to negotiate and execute a Cooperative Agreement with San Diego Coastkeeper, the San Diego Chapter of Surfrider Foundation, and any other interested environmental groups, for the study of the feasibility of diverting wastewater from the Point Loma Wastewater Treatment Plant through increased wastewater recycling, in exchange for their support of the EPA's tentative decision regarding the National Pollutant Discharge Elimination System permit for the Point Loma plant.

BE IT FURTHER RESOLVED, that any decision by the City to suspend or terminate the Cooperative Agreement is subject to the approval of the Mayor and City Council.

BE IT FURTHER RESOLVED, that the Mayor or his designee is authorized to negotiate and execute one or more agreements with consultants and experts as needed to meet the City's obligations under the Cooperative Agreement, in a cumulative amount not to exceed \$2,000,000, provided the City Comptroller first certifies the funds necessary for expenditure are, or will be, on deposit in the City Treasury.

BE IT FURTHER RESOLVED, that the City Comptroller is authorized to appropriate and expend an amount not to exceed \$2,000,000 from Sewer Fund 41509, solely and exclusively to hire consultants and experts needed to meet the City's obligations under the Cooperative Agreement.

BE IT FURTHER RESOLVED, that the City Comptroller is authorized to return excess budgeted funds, if any, to the appropriate reserves on advice of the administering department.

BE IT FURTHER RESOLVED, that the above activity is statutorily exempt from the California Environmental Quality Act pursuant to CEQA Guidelines section 15262 as feasibility and planning studies.

APPROVED: JAN I. GOLDSMITH, City Attorney

By _____
Thomas C. Zeleny
Chief Deputy City Attorney

TCZ:mb
01/21/09
01/27/09 Rev.
Cert.No:N/A
Or.Dept:CityAtty
R-2009-795 Rev.

I hereby certify that the foregoing Resolution was passed by the Council of the City of Diego, at its meeting of _____.

ELIZABETH S. MALAND, City Clerk

By _____
Deputy City Clerk

Approved: _____
(date)

JERRY SANDERS, Mayor

Vetoed: _____
(date)

JERRY SANDERS, Mayor